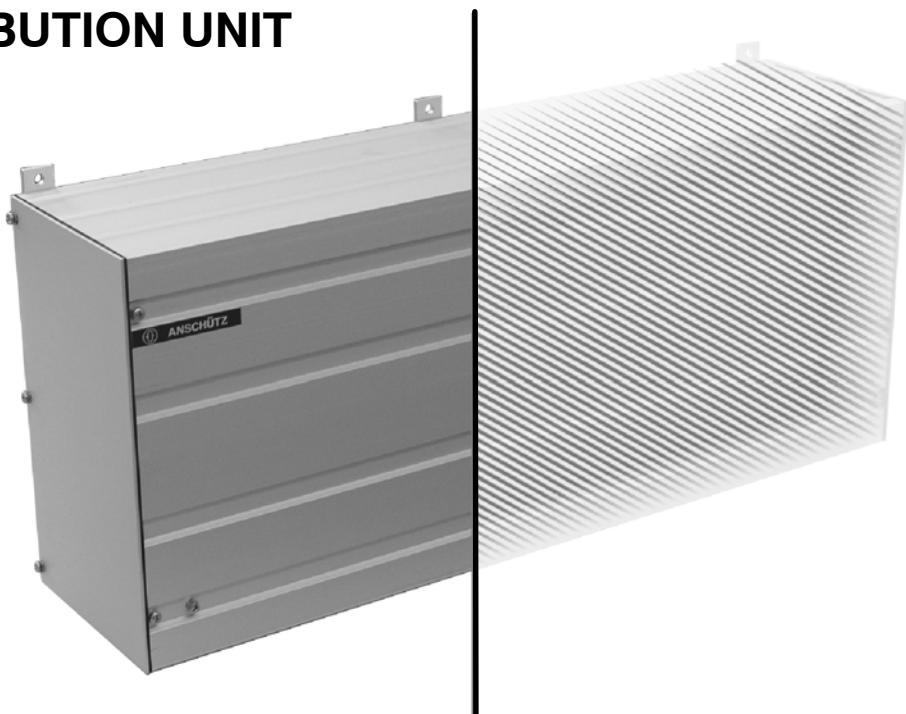




DISTRIBUTION UNIT

Type 138-118



- 1 Description
- 2 Installation

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Spare parts catalogue

Drawings:

Distribution Unit Dimensional Drawing	138-118 HP005
Distribution Unit Wiring Diagram	138-118 HP008
Distribution Unit Wiring Diagram	138-118 HP013 (E10)

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Konformitätserklärung des Herstellers

Artikel Nr. 10 der Richtlinie 96/98/EG

Manufacturer's Declaration of Conformity

Article 10 – EC-Directive 96/98/EC

Hiermit wird bestätigt, daß das nachfolgend aufgeführte Produkt dem baumustergeprüften Produkt entspricht und gemäß Qualitätssicherungs-Modul D erfolgreich getestet wurde.

This is to certify that the product identified below has been manufactured in accordance with type approved units and has been successfully tested according to the Quality Assurance Module D.

Produktbezeichnung/
 Product Designation:

**Gyrocompass System /
 Gyrocompass System for High Speed Craft**

Typ / Type:

Anschütz Gyro Compass Standard 22
 (Systemkomponenten siehe Anlage/
 system components see attached)

Baumusterprüfung durch/
 Type Examination by:

GL Luxembourg
 26, place de la Gare
 L-1616 Luxembourg

Benannte Stelle Nr. 0801/
 Notified Body No. 0801

Baumusterprüfbescheinigungen Nr./ 47778 - 03 Lux, 47779 - 03 Lux
 Type Examination Certificates No.:

Angewendete Normen
 und Richtlinien/-
 Applied Standards and
 Directives:

Directive 96/98EC / Additional Directive 2001/53/EC
 Additional Directive 2002/75/EC
 EN 61162-1, EN 60945, IEC 60945, IEC 61162-1
 EN ISO 8728, ISO 16328
 IMO Resolutions A.424 (XI), A.694 (17), A.813 (19)
 A.821(19), MSC.64 (67) Annex 4, MSC.97(73)

Diese Erklärung wird verantwortlich für den Hersteller abgegeben durch/
 This declaration has been made in the name of the manufacturer by:

Kiel, den 03.05.2004

Raytheon Marine GmbH
 Head of Quality Management

Raytheon Marine GmbH
 Head of Qualification / Certification



Michael Körner

Michael Körner on behalf of
 Martin Wloka



Günther Krappe

Distribution Unit

138-118



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Konformitätserklärung des Herstellers

Artikel Nr. 10 der Richtlinie 96/98/EG

Manufacturer's Declaration of Conformity

Article 10 – EC-Directive 96/98/EC

Anschütz Gyro Compass Standard 22

Auflistung der Systemkomponenten / Listing of the system components:

Gyro Compass	110-233
Gyrosphere	111-006
Operator unit	130-613
Distribution unit	138-118
Additional output box	146-103 NG001 ¹
AC DC Converter	121-062 ¹

¹ Optional

Additional configurations:

The master compass STANDARD 22 type 110-233 with Gyrosphere type 111-006.E001 may be also used with the system configurations and equipment listed in EC-type approval certificate No. 6297/0032/00 (STANDARD 20) from Bundesamt für Seeschiffahrt und Hydrographie (BSH) Germany, and listed in EC-type approval certificate No. 17063-00 GL Lux (GYROSTAR II) from GL Luxembourg.



Caused by technical progress the PC-Boards of the
Gyro Compass are changed.
Due to that some pictures and/or procedures have been
changed.
Respective changes are marked with "E10".

Safety instructions



Caution:

- ◆ Installation, maintenance and repair work must be carried out only by properly trained and qualified staff with a good knowledge of national equipment safety regulations.

Distribution Unit

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**1****General**

The Distribution Unit 138-118 consists of an aluminium casting in which 2 printed circuit board are integrated.

- I/O-PCB
- Interface PCB.

At the bottom of the casting there are 40 cable inlets for connecting repeaters, gyros and other heading receivers and sensors.

The task of this distribution Unit is:

- Distribution of heading information to all connected heading receivers.
- System monitoring by alarm-and status messages.
- Gateway between DV-Bus and CAN-Bus.
- Power supply of all connected heading receivers and heading sources (sensors).
- Storing of values for variation and deviation for the magnetic compass.

There are no operating procedures during the normal operation of the distribution unit. Only the setting to work-procedure needs some settings performed by DIP-Switches at the CAN Network Modul Interface PCB.

Options are:

“Additional output box” for additional output signals.

“AC/DC-Converter” to generate the supply voltage for the distribution unit.

1.1**CAN-Bus**

(CAN = Controller Area Network)

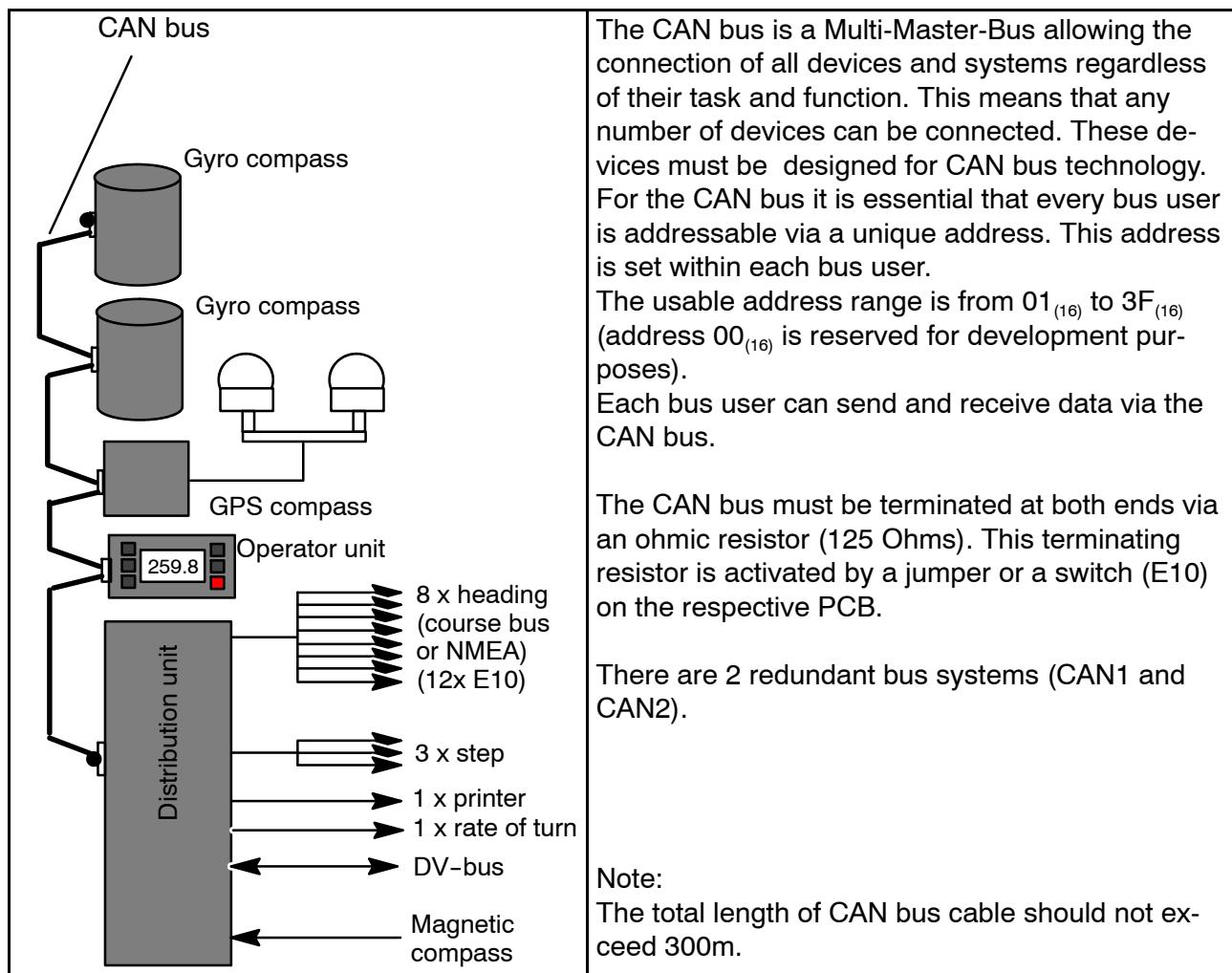


Fig.1: Principle of CAN bus

**1.2 Technical Data****1.2.1 Mechanical Data**

see Dimensional Drawing "Distribution Unit 138-118.HP005"

Equipment category: IP22

1.2.2 Electrical Data

Supply Voltage: 18VDC.....40VDC

Max. Current: 15A
(2 Gyros and 8 Repeaters)

Input:

-Spd-Log		Pulslog
-NMEA GPS		NMEA log
-Log		
-CAN Bus		
-DV Bus		
-TMC		

Output:

- 8 Outputs (adjustable, with supply voltage 24V DC)

E10

- 8 Outputs (adjustable, with supply voltage 24V DC)

- 4 Outputs (adjustable, without supply voltage)

Heading serial (Course bus)

NMEA1

NMEA2

-RoT+/-10V (polarity adjustable)

-Course Printer Interface RS232C

-3 STEP-signal 1/6°/step (with supply voltage 35V DC)

- DV-bus

- CAN bus

Optional with an "Additional Output Box 146-103

Fast NMEA, SIF, STEP

1.3

Information about LED's, push buttons, switches, plugs and connectors of the integrated PCB's

1.3.1

Interface PCB and I/O PCB

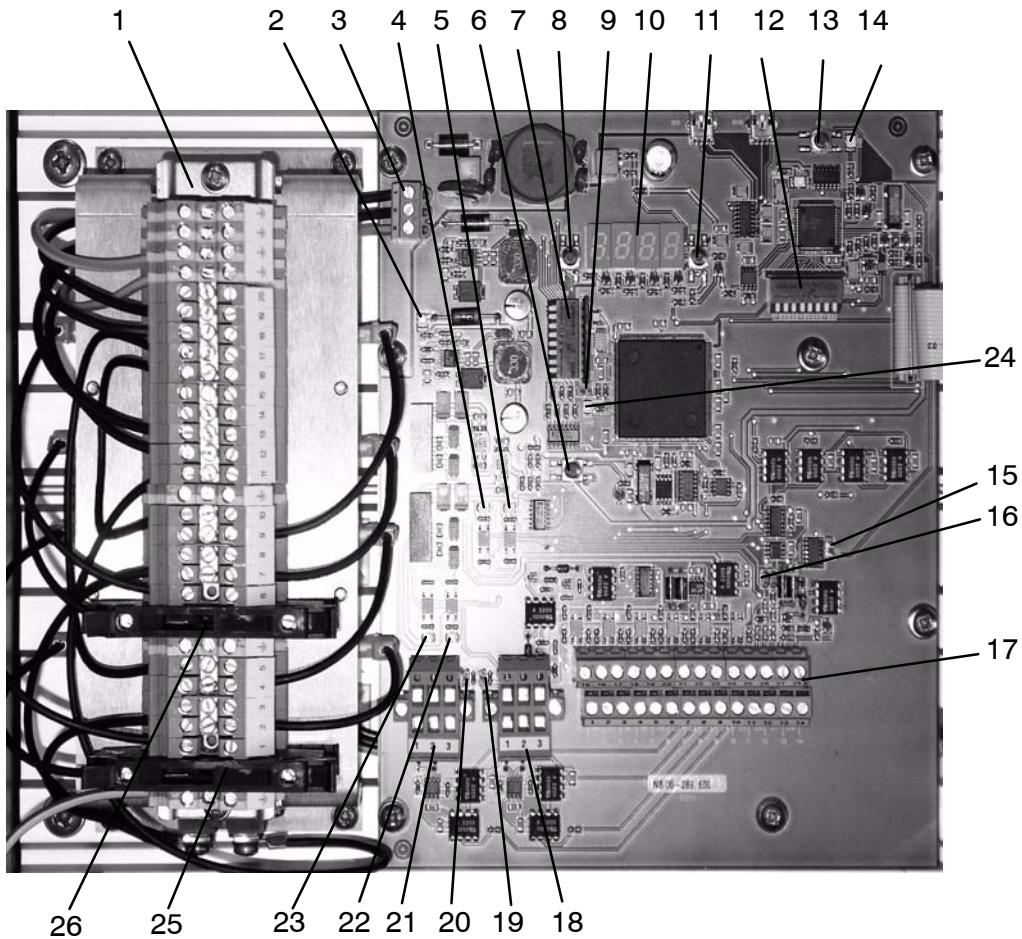


Fig.2: Interface PCB (138-118.100)

No.	Designation at the Interface PCB	Remark
Fig.2/1	Terminal Board L1 of the Distribution Unit	Connection of supply voltages for the distribution unit itself and for connected gyros, operator unit and heading receivers.
Fig.2/2	LED H1	+5VDC DC/DC-Converter for CAN-Bus and Course Bus
Fig.2/3	Terminal Board L1 of the Interface PCB	Supply Voltage (+24V DC) for this PCB
Fig.2/4	LED H7	+5VDC Course Bus
Fig.2/5	LED H4	+5VDC DV-Bus
Fig.2/6	Push Button B21	Reset Processor (CAN bus)
Fig.2/7	DIP-Switch B20	Adjustments for the Distribution Unit
Fig.2/8	Push Button B23	Mode-Selection for DIP-Switch B20
Fig.2/9	Jumper B2	Course-Bus/NMEA (Test only)
Fig.2/10	Display	
Fig.2/11	Push Button B22	Set-function for DIP-Switch B20
Fig.2/12	DIP Switch B24	DV-Bus setting (not used)
Fig.2/13	Push Button B11	Reset Processor (DV-Bus)
Fig.2/14	LED H6	Programming
Fig.2/15	Jumper B1	Programming (never set, development only)
Fig.2/16	Jumper B4	Bus-Resistor DV-Bus (to be set if distribution unit is an end device)
Fig.2/17	Terminal Board L2	Connection of Signals
Fig.2/18	Plug B6	CAN1-Bus
Fig.2/19	Jumper B31	Bus-Resistor CAN1-Bus
Fig.2/20	Jumper B32	Bus-Resistor CAN2-Bus
Fig.2/21	Plug B7	CAN2-Bus
Fig.2/22	LED H3	+5VDC CAN2-Bus
Fig.2/23	LED H2	+5VDC CAN1-Bus
Fig.2/24	LED H8	Processor clock
Fig.2/25	Fuse E1	10A, T; 24V DC input "Gyro1"
Fig.2/26	Fuse E2	10A, T; 24V DC input "Gyro2"

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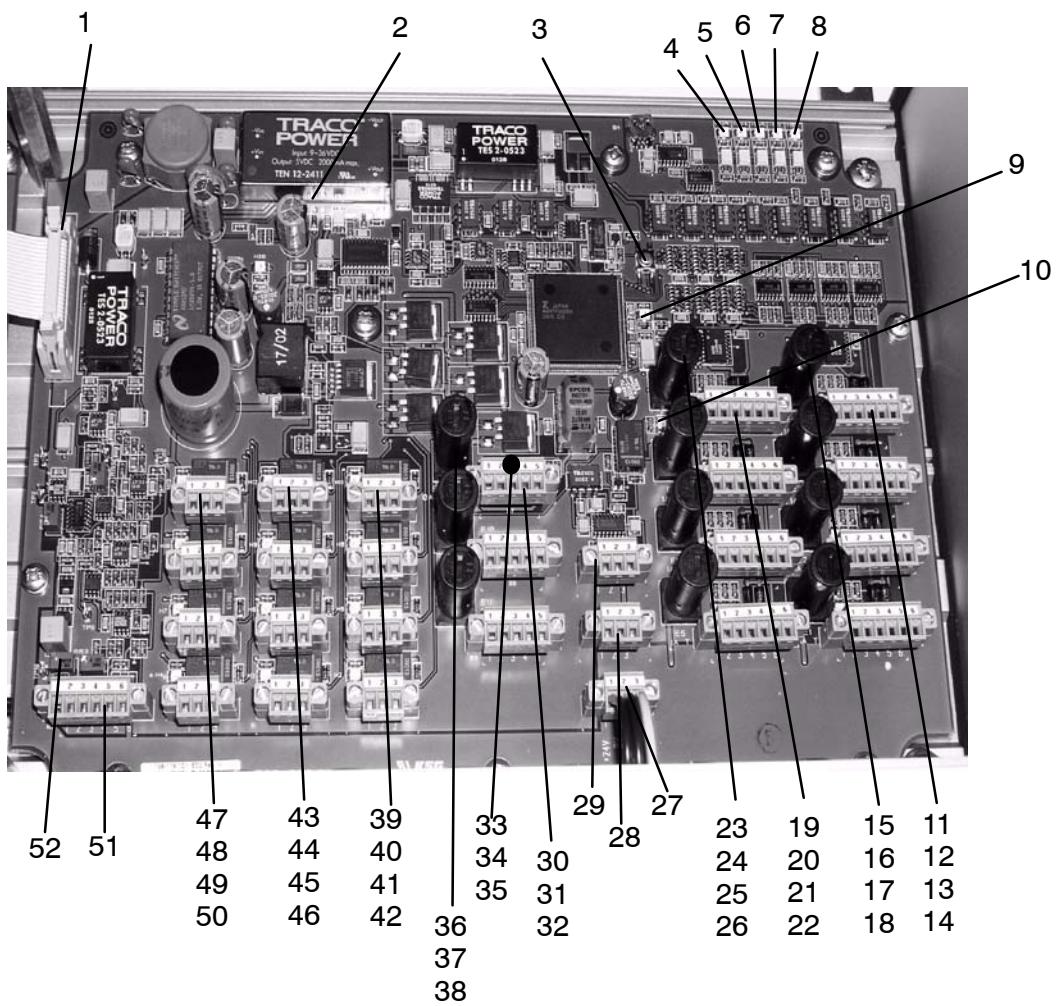


Fig.3:I/O PCB (138-118.101)

No.	Designation at the I/O PCB	Remark
Fig.3/1	Connector B1	Connection to the Interface PCB
Fig.3/2	LED H30	35V DC Voltage (Step)
Fig.3/3	Push Button B40	Processor Reset
Fig.3/4	LED +5V5	+5VDC for RoT-Conversion
Fig.3/5	LED +5V4	+5VDC galvanically separated supply voltage
Fig.3/6	LED +5V6	+5VDC for RS232C Interface (Printer)
Fig.3/7	LED -15V	RoT Supply voltage
Fig.3/8	LED +15V	RoT Supply Voltage
Fig.3/9	LED H1	Processor Clock
Fig.3/10	LED H50	Relays ON/OFF Step-Supply
Fig.3/11	Plug B26	Output Channel 4 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/12	Plug B25	Output Channel 3 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/13	Plug B24	Output Channel 2 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/14	Plug B23	Output Channel 1 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/15	Fuse E4, 1A T	Protection for Channel 4
Fig.3/16	Fuse E3, 1A T	Protection for Channel 3
Fig.3/17	Fuse E2, 1A T	Protection for Channel 2
Fig.3/18	Fuse E1, 1A T	Protection for Channel 1
Fig.3/19	Plug B30	Output Channel 8 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/20	Plug B29	Output Channel 7 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus

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No.	Designation at the I/O PCB	Remark
Fig.3/21	Plug B28	Output Channel 6 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/22	Plug B27	Output Channel 5 with 3 LED's blue = NMEA 2 green = NMEA 1 red = Course bus
Fig.3/23	Fuse E8, 1A T	Protection for Channel 8
Fig.3/24	Fuse E7, 1A T	Protection for Channel 7
Fig.3/25	Fuse E6, 1A T	Protection for Channel 6
Fig.3/26	Fuse E5, 1A T	Protection for Channel 5
Fig.3/27	Plug B3	+24V DC supply voltage for repeaters
Fig.3/28	Plug B5	RoT-Output +/-10VDC
Fig.3/29	Plug B6	Plug for connection Printer (RS232C Interface)
Fig.3/30	Plug B7	Step-output 1
Fig.3/31	Plug B8	Step-output 2
Fig.3/32	Plug B9	Step-output 3
Fig.3/33	LED H49	Indication Step-Interface 1
Fig.3/34	LED H48	Indication Step-Interface 2
Fig.3/35	LED H47	Indication Step-Interface 3
Fig.3/36	Fuse E9, 0.25A T	Protection for Step-output 1
Fig.3/37	Fuse E10, 0.25A T	Protection for Step-output 2
Fig.3/38	Fuse E11, 0.25A T	Protection for Step-output 3
Fig.3/39	Plug B20 with LED H11	Status-Signal with indication "GPS COMPASS SELECTED"
Fig.3/40	Plug B17 with LED H8	Status-Signal with indication "SENSOR DIFF. ALARM"
Fig.3/41	Plug B14 with LED H5	Status-Signal with indication "SENSORALARM G3/GPS"
Fig.3/42	Plug B11 with LED H2	Status-Signal with indication "SYSTEMALARM"
Fig.3/43	Plug B21 with LED H12	Status-Signal with indication "CAN DISTURBED"
Fig.3/44	Plug B18 with LED H9	Status-Signal with indication "TMC SELECTED"
Fig.3/45	Plug B15 with LED H6	Status-Signal with indication "SENSORALARM TMC"

No.	Designation at the I/O PCB	Remark
Fig.3/46	Plug B12 with LED H3	Status-Signal with indication “SENSORALARM G1”
Fig.3/47	Plug B22 with LED H13	General Alarm RESET
Fig.3/48	Plug B19 with LED H10	Status-Signal with indication “GYRO SELECTED”
Fig.3/49	Plug B16 with LED H7	Status-Signal with indication “MONITORALARM GYRO/TMC”
Fig.3/50	Plug B13 with LED H4	Status-Signal with indication “SENSORALARM G2”
Fig.3/51	Plug B2	TMC Connector IN/OUT
Fig.3/52	Jumper B41	Test purpose

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1.3.2

Terminal Board, Interface PCB and I/O PCB (E10)

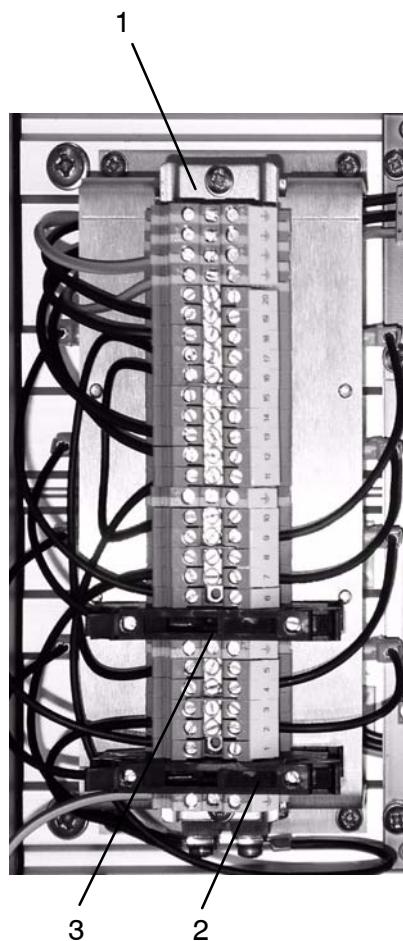


Fig.4: Terminal board L1

No.	Designation	Remark
Fig.4/1	Terminal board L1	Connection for the supply voltage for the Distribution Unit itself, for the connected compasses, the Operator Unit and the heading receivers.
Fig.4/2	Fuse E1	10 A, T; 24V DC-Input Gyro 1
Fig.4/3	Fuse E2	10 A, T; 24V DC-Input Gyro 2

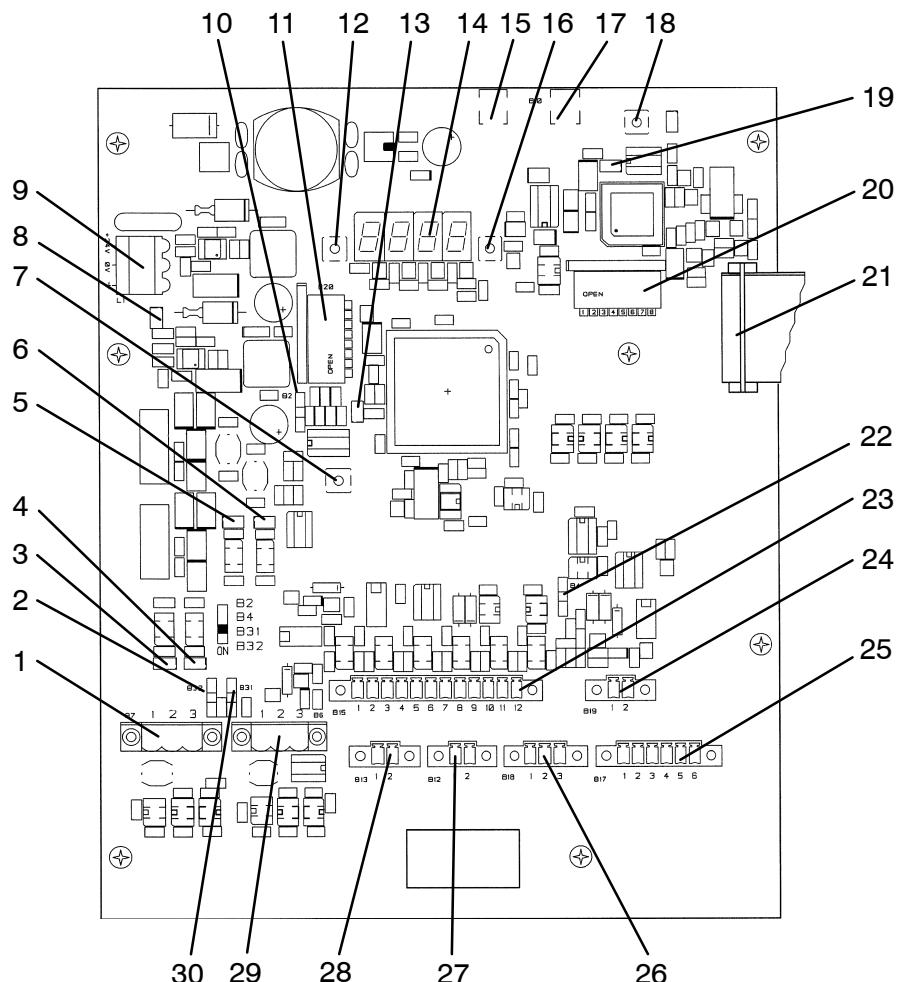


Fig.5: Interface PCB (138-118.100 E10)

No.	Designation at the Interface PCB E10	Remark
Fig.5/1	Plug B7	CAN2-Bus
Fig.5/2	Switch B32	Resistor CAN2-Bus
Fig.5/3	LED H2	+5V DC CAN1-Bus
Fig.5/4	LED H3	+5V DC CAN2-Bus
Fig.5/5	LED H7	+5V DC Course bus
Fig.5/6	LED H4	+5V DC DV-Bus
Fig.5/7	Push button B21	Reset Processor (CAN-Bus)
Fig.5/8	LED H1	+5V DC DC/DC-Converter for CAN-bus and Course bus

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No.	Designation at the Interface PCB E10	Remark
Fig.5/9	Terminal board L1 of the Interface PCB	Supply voltage +24V DC for the Interface PCB
Fig.5/10	Switch B2	Course bus/NMEA (test purpose only)
Fig.5/11	DIP-Switch B20	Einstellungen für die Distribution Unit
Fig.5/12	Push button B23	Mode selection together with DIP-Switch B20
Fig.5/13	LED H8	Processor clock (CAN-Bus Processor)
Fig.5/14	Display	
Fig.5/15	Plug B9	Connection to flash CAN bus Processor
Fig.5/16	Push button B22	Set-Function together with DIP-Switch B20
Fig.5/17	Plug B10	Connection to flash DV-bus Processor
Fig.5/18	Push button B11	Reset Processor (DV-bus)
Fig.5/19	LED H5	Processor clock (DV-bus Processor)
Fig.5/20	DIP-Switch B24	DV-bus adjustments (not used)
Fig.5/21	Plug B3	Connection to the I/O PCB
Fig.5/22	Switch B4	Bus resistor DV-bus (only if the Distribution Unit is used as an end device in a DV-bus application)
Fig.5/23	Plug B15	Connection for LOG, Control signals and status signals
Fig.5/24	Plug B19	Connection MINS/RoT (Input)
Fig.5/25	Plug B17	Connection DV-Bus (Output)
Fig.5/26	Plug B18	Connection Kursbus (Output)
Fig.5/27	Plug B12	Connection GPS (Input)
Fig.5/28	Plug B13	Connection Data for SEC (Input)
Fig.5/29	Plug B6	Connection CAN1-bus
Fig.5/30	Switch B31	Resistor CAN1-bus

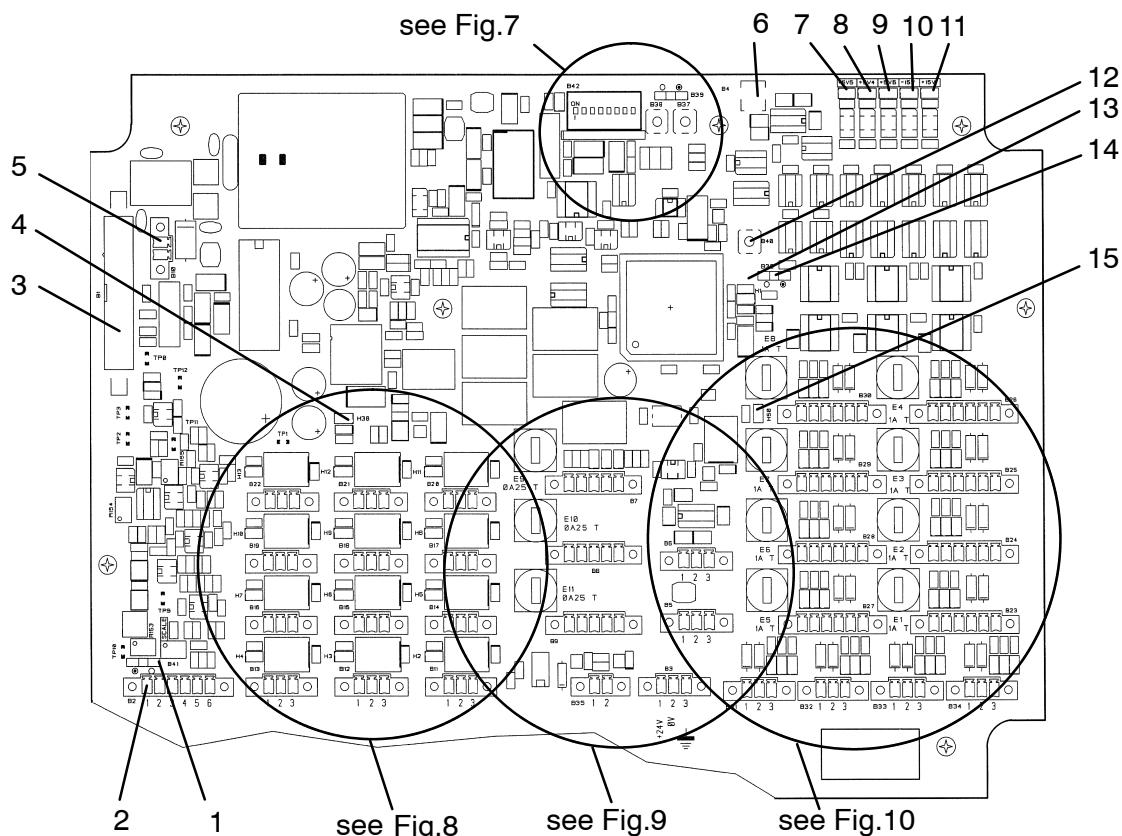


Fig.6: I/O PCB (138-118.101. E10)

No.	Designation at the I/O PCB E10	Remark
Fig.6/1	Switch B41	Test purpose only. Has to be always in closed position.
Fig.6/2	Plug B2	TMC Connection IN/OUT
Fig.6/3	Plug B1	Connection to the Interface PCB
Fig.6/4	LED H38	35V DC for Step-function, lights up if present
Fig.6/5	Plug B10	Supply voltage 24V DC for the I/O PCB
Fig.6/6	Plug B4	Connection to flash
Fig.6/7,8, 9,10,11	LEDs H42,H40,H41,H44,H43	Lights up if operating voltages + 5V DC and +/- 15V DC are present.
Fig.6/12	Push button B40	Reset CPU, after flashing
Fig.6/13	LED H1	Processor clock, blinks green
Fig.6/14	Switch B36	Not used, for future purpose
Fig.6/15	LED H50	Lights up red if the 35V DC for the Step-function are switched off.

Distribution Unit

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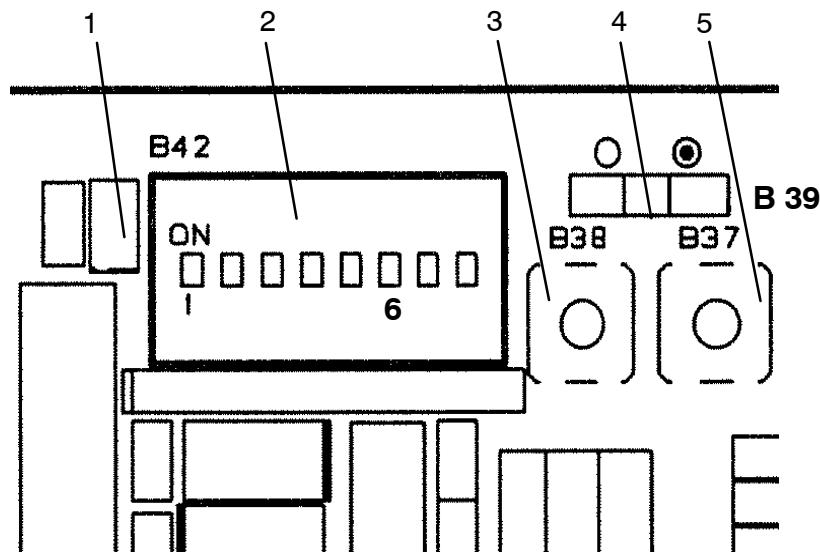


Fig.7: I/O PCB (138-118.101. E10)

No.	Designation at the I/O PCB E10	Remark
Fig.7/1	LED H60	not used
Fig.7/2	Switch B42	not used
Fig.7/3	Push button B38	no function, not used
Fig.7/4	Switch B39	no function, not used
Fig.7/5	Push button B37	no function, not used

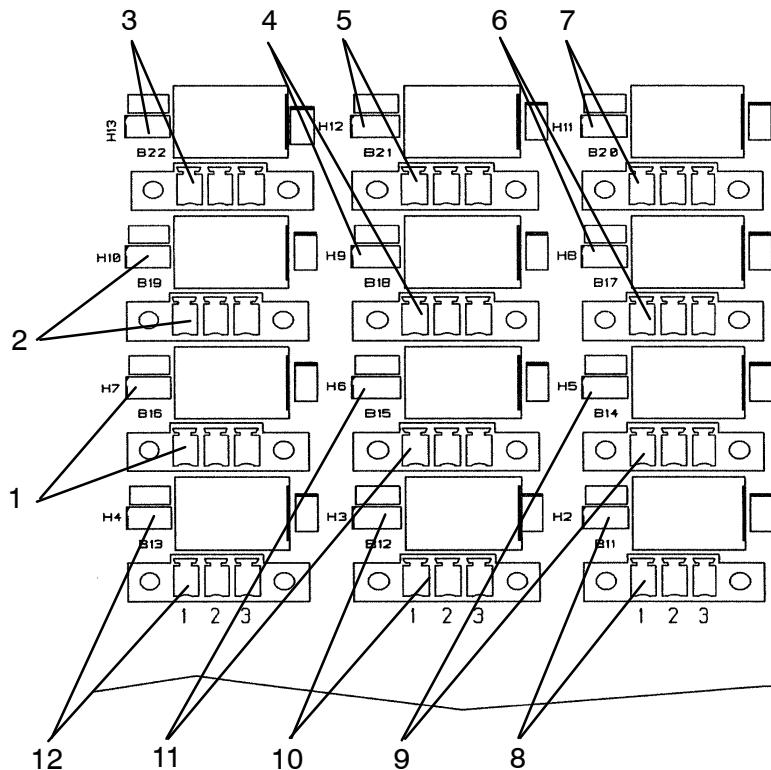


Fig.8: I/O PCB (138-118.101. E10)

No.	Designation at the I/O PCB E10	Remark
Fig.8/1	Plug B16 with LED H7	Status-signal-connection with indication "MONITORALARM GYRO/TMC"
Fig.8/2	Plug B19 with LED H10	Status-signal-connection with indication "GYRO SELECTED"
Fig.8/3	Plug B22 with LED H13	General Alarm RESET
Fig.8/4	Plug B18 With LED H9	Status-signal-connection with indication "TMC SELECTED"
Fig.8/5	Plug B21 with LED H12	Status-signal-connection with indication "CAN DISTURBED"
Fig.8/6	Plug B17 with LED H8	Status-signal-connection with indication "SENSOR DIFF. ALARM"
Fig.8/7	Plug B20 with LED H11	Status-signal-connection with indication "GPS COMPASS SELECTED"
Fig.8/8	Plug B11 with LED H2	Status-signal-connection with indication "SYSTEMALARM"

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No.	Designation at the I/O PCB E10	Remark
Fig.8/9	Plug B14 with LED H5	Status-signal-connection with indication "SENSORALARM G3/GPS"
Fig.8/10	Plug B12 with LED H3	Status-signal-connection with indication "SENSORALARM G1/GPS"
Fig.8/11	Plug B15 with LED H6	Status-signal-connection with indication "SENSORALARM TMC"
Fig.8/12	Plug B13 with LED H4	Status-signal-connection with indication "SENSORALARM G2/GPS"

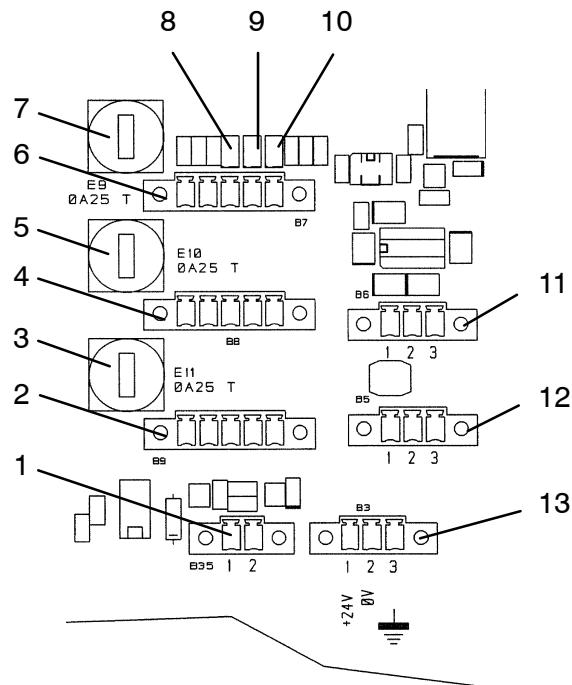


Fig.9: I/O PCB (138-118.101. E10)

No.	Designation at the I/O PCB E10	Remark
Fig.9/1	Plug B35	Connection of Course bus to the I/O PCB.
Fig.9/2	Plug B9	Connection of Step-output.
Fig.9/3	Fuse E11	Protection (0,25A, slow) 35V DC of the Step-output at plug B9.
Fig.9/4	Plug B8	Connection of Step-output.
Fig.9/5	Fuse E 10	Protection (0,25A, slow) 35V DC of the Step-output at plug B8.
Fig.9/6	Plug B7	Connection of Step-output.
Fig.9/7	Fuse E9	Protection (0,25A, slow) 35V DC of the Step-output at plug B7.
Fig.9/8,9 and 10	LED H47, 48 and 49	Image of the Step-outputs
Fig.9/11	Plug B6	Connection of Course Printer.
Fig.9/12	Plug B5	Connection of RoT (analog).
Fig.9/13	Plug B3	24V DC connection to supply the repeaters connected at the output channels 1 to 8.

Distribution Unit

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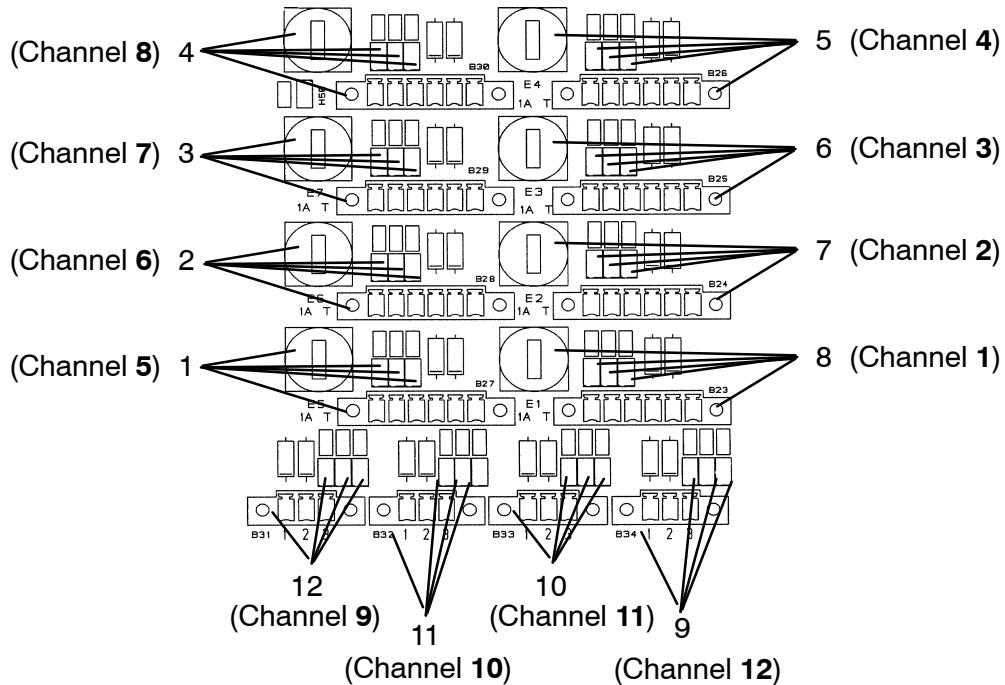


Fig.10: I/O PCB (138-118.101. E10)

No.	Designation at the I/O PCB E10	Remark
Fig.10/1	Plug B 27 Fuse E5 LED 26 (red) LED 27 (green) LED 28 (blue)	Output channel 5 to connect repeater with supply voltage. Connection, protection and indication of the adjusted data format. LED red = Course bus LED green = NMEA 1 LED blue = NMEA 2
Fig.10/2	B 28, E 6, H 29, H 30, H 31	Output channel 6
Fig.10/3	B 29, E 7, H 32, H 33, H 34	Output channel 7
Fig.10/4	B 30, E 8, H 35, H 36, H 37	Output channel 8
Fig.10/5	B 26, E 4, H 23, H 24, H25	Output channel 4
Fig.10/6	B 25, E 3, H 20, H 21, H22	Output channel 3
Fig.10/7	B 24, E 2, H 17, H 18, H 19	Output channel 2
Fig.10/8	B 23, E 1, H 14, H 15, H 16	Output channel 1

No.	Designation at the I/O PCB E10	Remark
Fig.10/9	Plug B 34 LED H 57 (red) LED H 56 (green) LED H 55 (blue)	Output channel 12 to connect repeater without supply voltage. Connection and indication of the adjusted data format. LED red = Course bus LED green = NMEA 1 LED blue = NMEA 2
Fig.10/10	B 33, H 54, H 55, H 56	Output channel 11
Fig.10/11	B 32, H 51, H 52, H 53	Output channel 10
Fig.10/12	B 31, H 39, H 45, H 46	Output channel 9

2 Installation of the Distribution Unit

2.1

General remarks



Caution

When establishing cable connections ensure that the cables are disconnected from the power supply. It is essential to ensure that all cables are disconnected from the power supply, if necessary measure the voltage beforehand and/or disconnect the relevant distributor.

In order to ensure that the system operates correctly, it is essential that you follow the procedures described below for establishing cable connections.

- Strip approx. 180mm of the cable.
Make sure you do not damage the shielding layer.
- Strip off the shielding to a remainder of approximately 15mm.

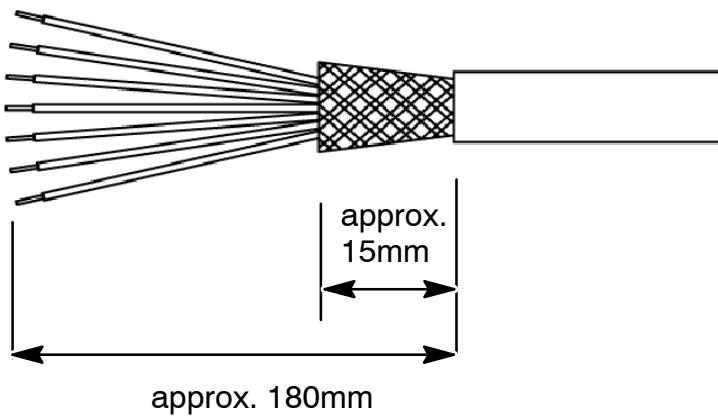


Fig.11 How to strip the connection cable

- Screw the cable gland out from the distribution box and push the screw connection components over the cable.
It is absolutely essential that the sequence (as shown in Fig.12) is adhered to.
- Check the cone and counterpart on the earthing insert for corrosion and if necessary remove corrosion using an appropriate process (emery board).

- Push the counterpart of the earthing insert as far as the end of the cable shield.
- Push the earthing insert cone below the shielding against the counterpart. Observe a shared evenly distribution of the shielding via the cone (see Fig.12).

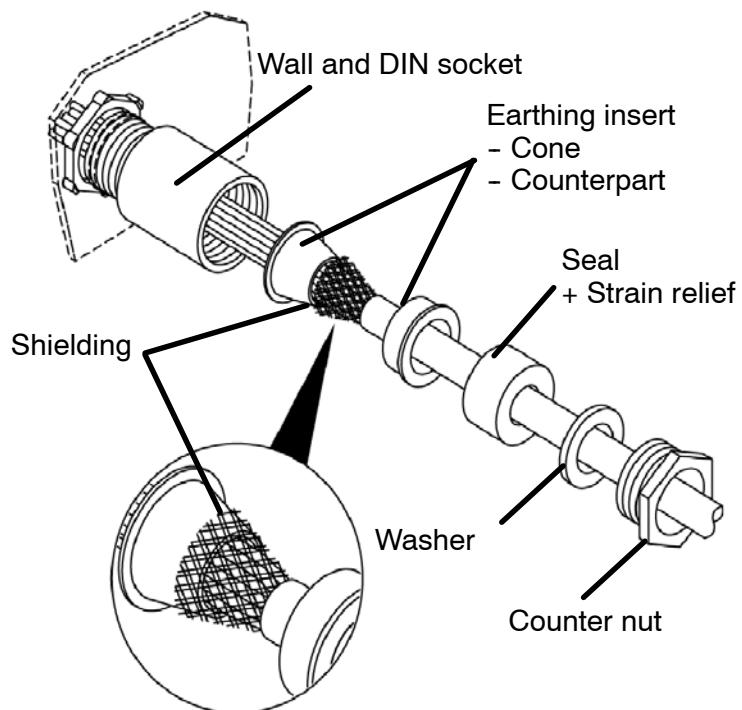


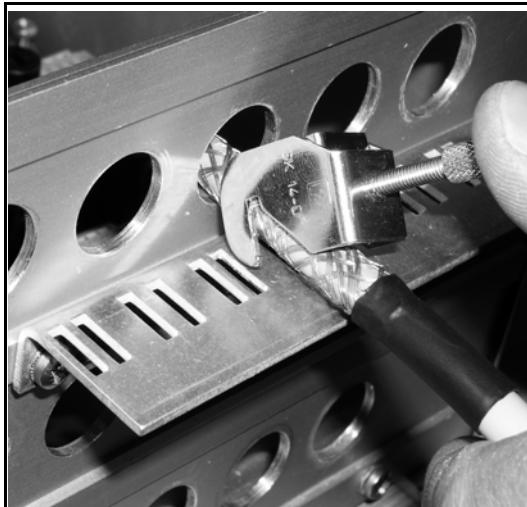
Fig.12 Making the cable entry

- Insert the earthing insert, the seal with and the washer into the cable gland, place the counter nut on top and hand-tighten.
- Strip the cable cores to a length of approx. 1.5cm, twist slightly and clamp on the cable end sleeves. Connect the cable strands in the junction box as shown in the table below. Hand-tighten the terminal screws concerned
- Check the connection is firm by pulling lightly.

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Option: Cable connection with a screen clamp

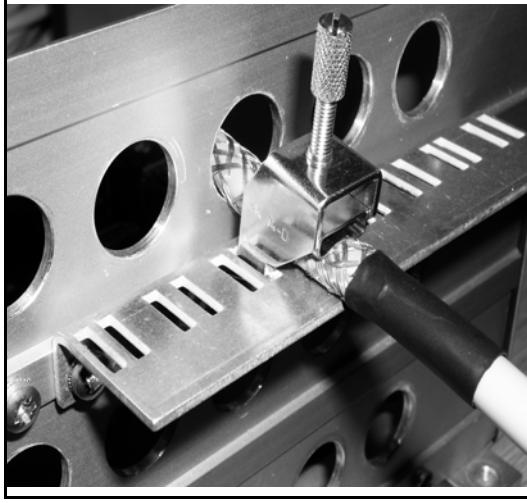


Attach the angle with cross slotted screws below the respective cable inlet at the housing. (angle and screws are part of the installation kit).

Strip off the cable according to section 2.1.



The screen must be led for appr. 15mm through the cable inlet (as shown).



Jam the cable (screen area) with the screw-clamp at the angle and fix it with the knurled head screw.

2.1.1

General information about establishing an earth connection

In order to comply with the stringent EMC requirements, please abide by the information given below regarding cable connections.

Use the cable types specified.

Earth connections should be connected to the gyro compass and to the junction box.

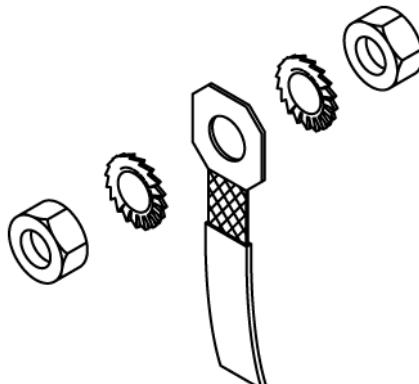
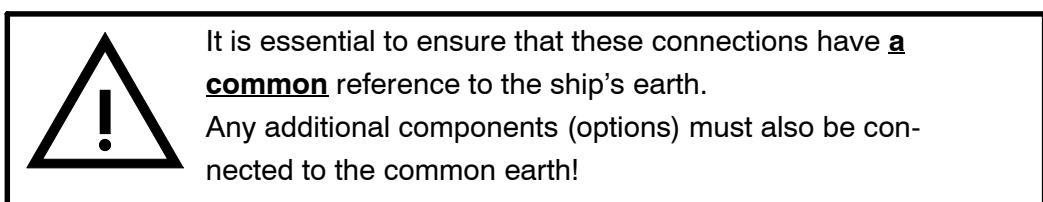


Fig.13: Establishing an earth connection

All earth connections must be made as shown in Fig.13.

The earthing cable attached to the cable bracket must possess a cross-section of minimum 1.5 mm².

The cable bracket should be mounted between two toothed discs.

Earth connections must be free of corrosion and well fastened.

2.2

Installation

The distribution unit has to be mounted according to the dimensional drawing 138-118.HP005.

The front cover should be removable.

Please note the comment depending the internal protection at the dimensional drawing.

2.2.1

Installation of the options

For installations of the options, as there are "Additional Output Box" and "AC/DC-Converter", see service manual of the Compass STD 22 Compact.

NOTE: While connecting the AC/DC-Converter one cable inlet between "AC IN" and "DC OUT" must not be used

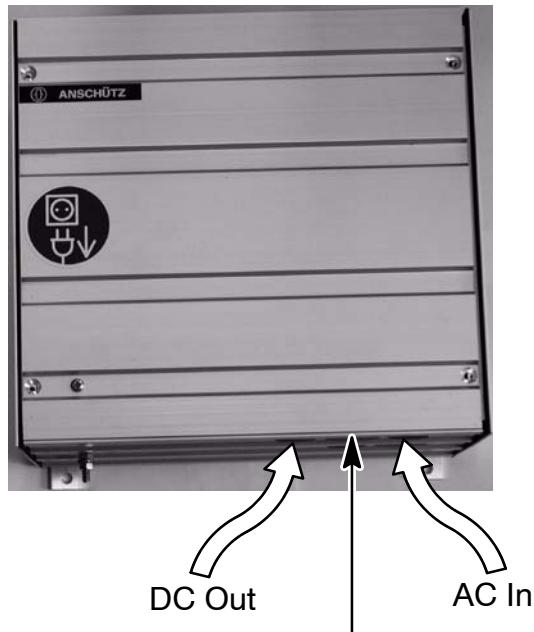
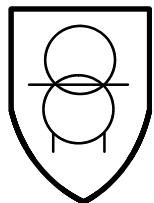


Fig.14: Connection at the AC/DC-Converter

The installation of the power supply (AC/DC-Converter) should only be performed by an experienced electrician.



The supply voltage has to be engineered as a low-security-voltage according to SELV.

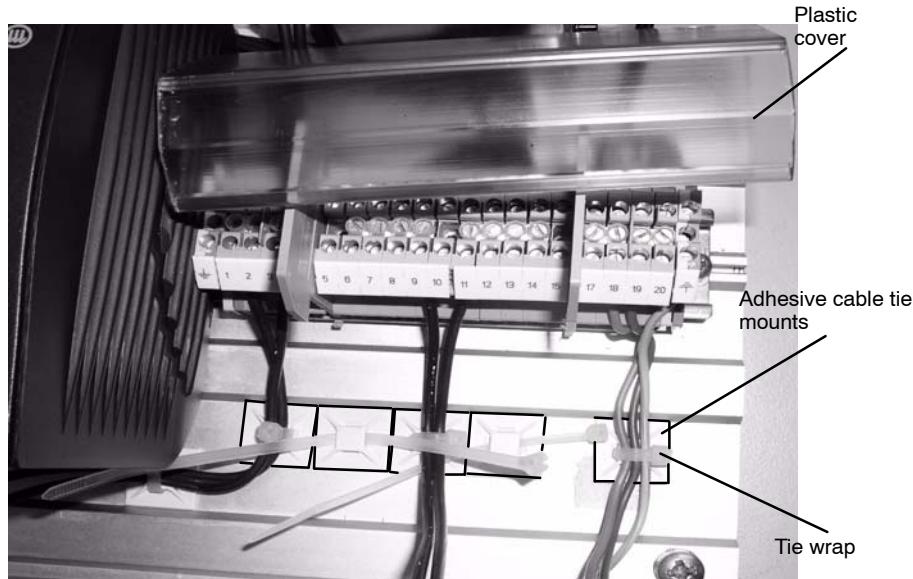


Fig.15 Cable connections at the AC/DC-Converter

To connect the cables to the terminal board, the plastic cover has to be pulled off from the terminal board.

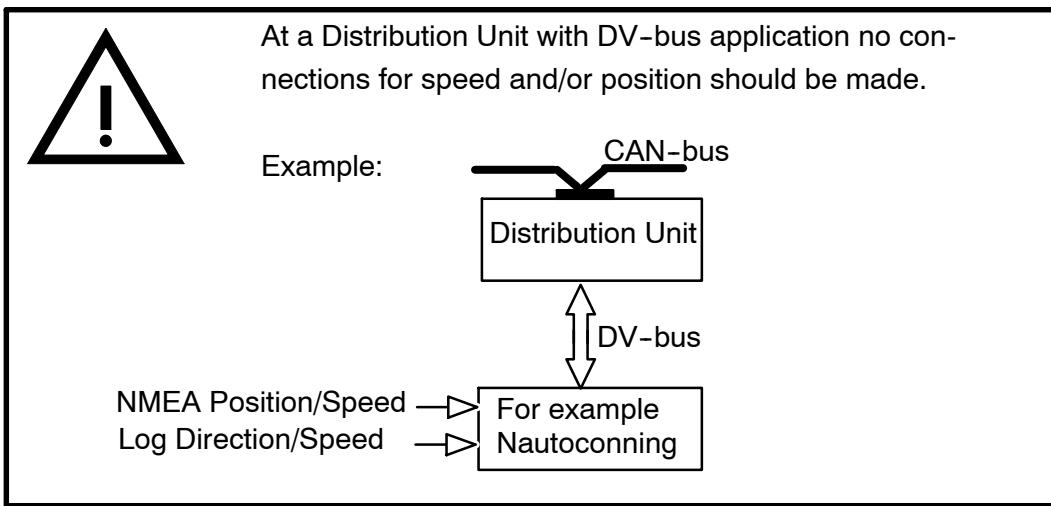
Cables should not be lengthened too long, to prevent a short circuit to a neighbour terminal by an inadvertently loosening.

Additionally the cable should be fixed (as shown in Fig.15) with tie wraps and self adhesive tie mounts.

After that the plastic cover has to be pulled on the terminal board.

2.3

Connections



All connections to terminal boards and plugs have to be made according appended drawings.

Please note manufacturer recommendations depending on the cable-diameters.

2.3.1

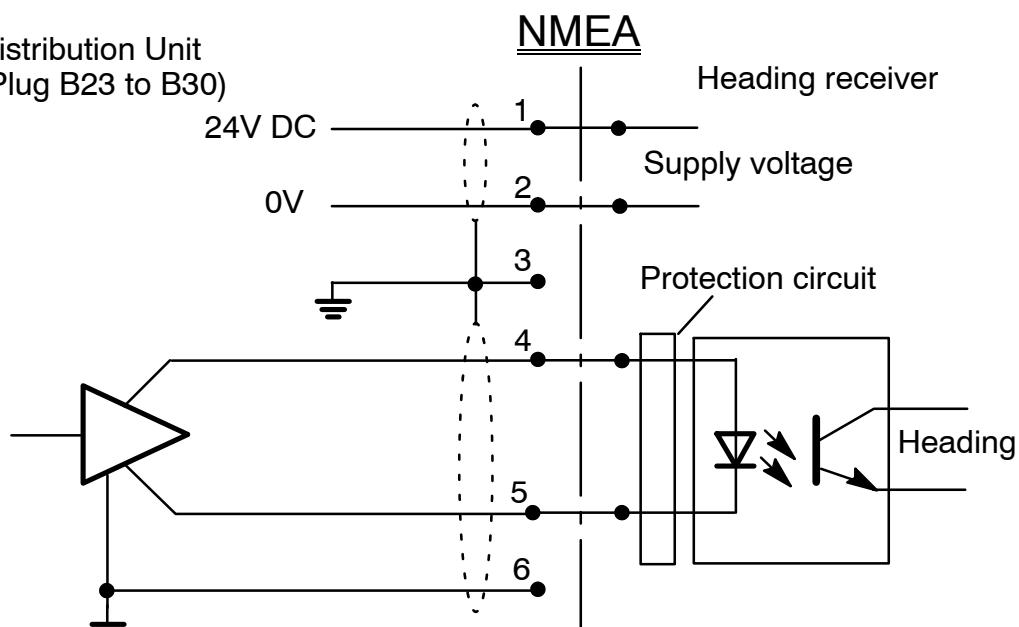
RS422-Interface or NMEA Interface of Heading Receiver



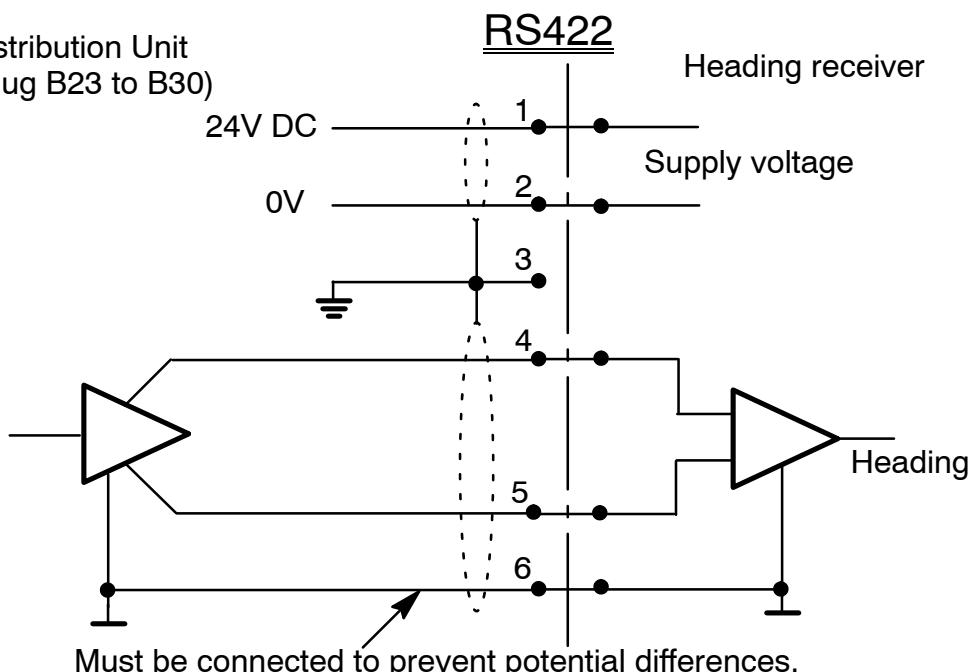
Conclusion for the connection of NON RAYTHEON Anschütz products to the Distribution Unit:

If the NMEA input interface or the coursebus input interface contains a "signal common / signal ground" connection, then this connection has to be connected to "signal common / signal ground" connection of the Distribution Unit (see principle scematic below).

Distribution Unit
(Plug B23 to B30)



Distribution Unit
(Plug B23 to B30)



2.3.2

Connection of the Options

For connection of the options, as there are “Additional Output Box” and “AC/DC-Converter”, see service manual of the Compass STD 22 Compact.

For connection of a UTC-signal (time-synchronisation of a connected course-printer), see section 8 seq. no. 41.

For connection of an Alarm-Reset-function see respective drawings at the appendix.

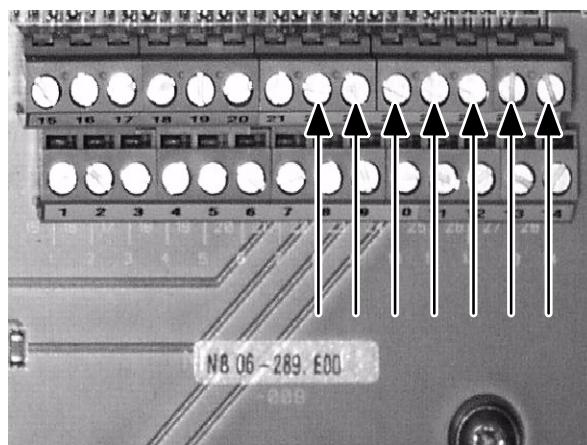
With this function an alarm signal can be reset centrally.

This function has to be connected at plug B22 of the I/O PCB.

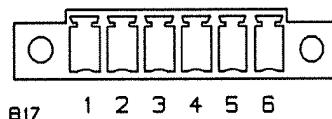
2.3.3

Connection of DV-bus

Connections have to be made according section 2.1 and appended drawings.



Interface PCB:
Anschlußklemme L2



Interface PCB (E10):
Anschlußklemme B17

Fig.16: DV-bus connection

Function	Terminal board L2	Plug B17 (E10)
Screen A	22	1
Core A	23	2
Core A	24	3
Core B	25	4
Core B	26	5
Screen B	27	6

Switching On the Distribution Unit

After connecting the supply voltage, the Distribution Unit is switched on.

All direct connected devices (as there are compass, and repeater with supply voltage) to the Distribution Unit are supplied with operating voltage as well.

There is no separate switch for the Distribution Unit.

4 Setting of Jumpers and Adjusting the DIP-Switches**4.1 Setting of Jumpers**

Basically 3 jumpers have to be awarded.

These jumpers are the terminators (resistors which terminate the CAN-bus and the DV-bus).

Is a distribution Unit used as an so called "end-device" within a CAN-bus and DV-bus application, all jumpers have to be set. These jumpers activates the terminators at the end of each CAN-bus and DV-bus

Not inserted jumpers (open CAN-Bus and/or open DV-bus) lead to an error message at the Distribution Unit.

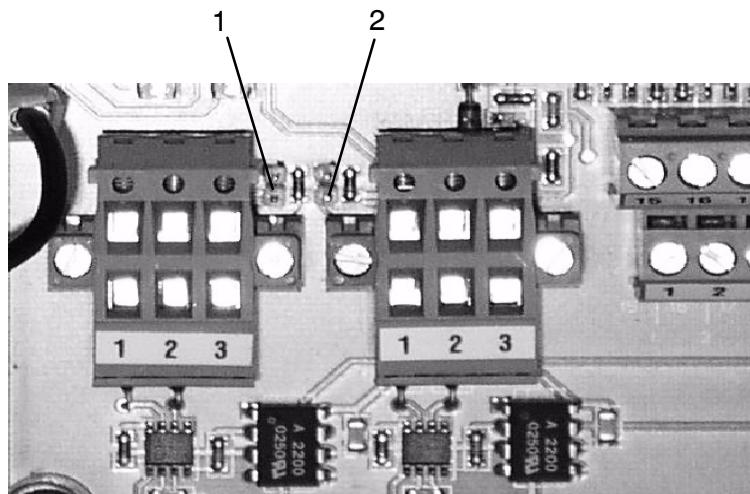


Fig.17: CAN-Bus terminators

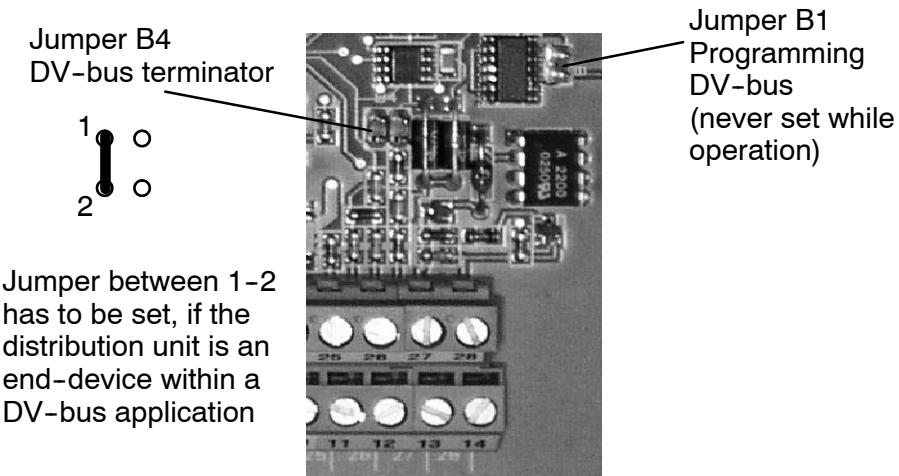
1 = Jumper B32 to activate terminator CAN1-Bus

2 = Jumper B31 to activate terminator CAN2-Bus

Fig.18: DV-bus terminator

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4.1.1

Activation the termination resistors by switches (E10)

Basically 3 switches have to be awarded.

These switches are the terminators (resistors which terminate the CAN-bus and the DV-bus).

Is a distribution Unit used as an so called "end-device" within a CAN-bus and DV-bus application, all switches have to be set. These switches activates the terminators at the end of each CAN-bus and of the DV-bus

Not activated terminators (open CAN-Bus and/or open DV-bus) lead to an error message at the Distribution Unit.

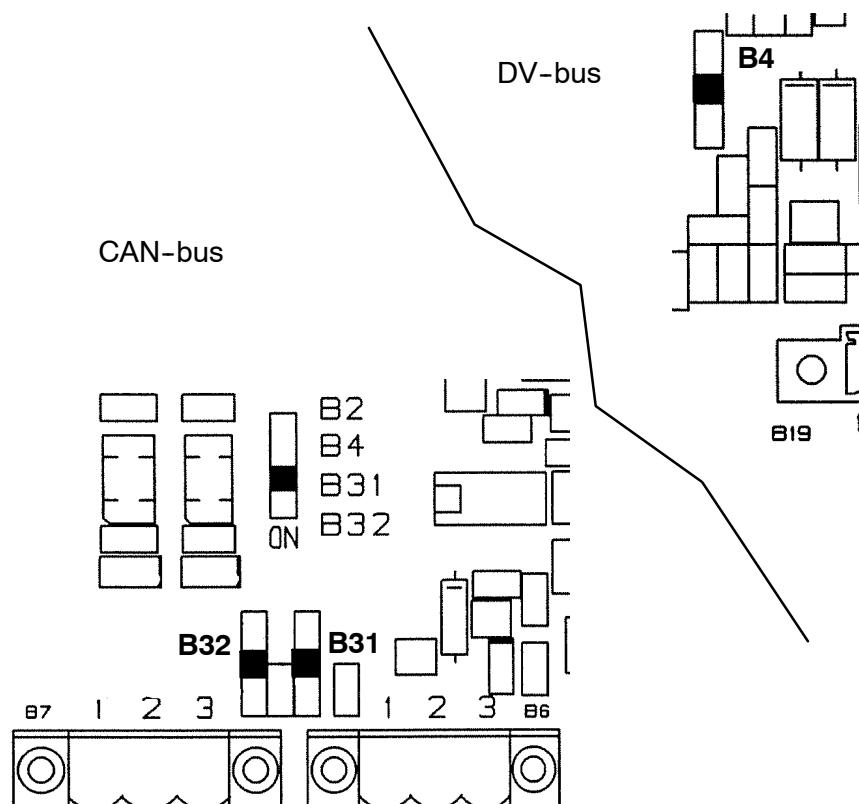


Fig.19: Switches to activate the terminators

Switch B32 in position ON activates the terminator for CAN1-bus

Switch B31 in position ON activates the terminator for CAN2-bus

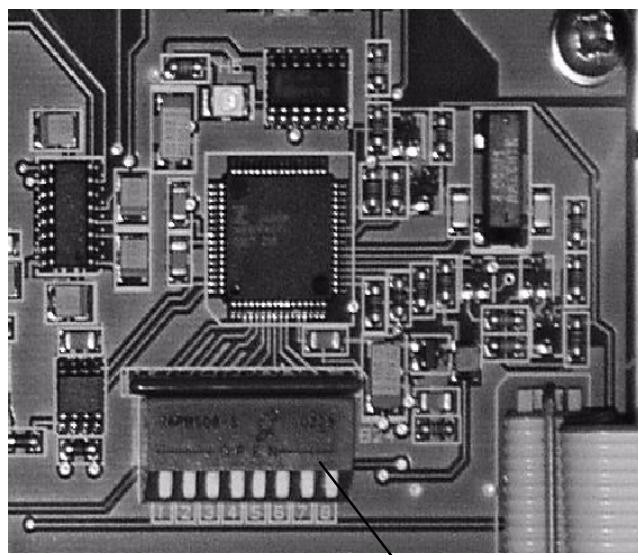
Switch B4 in position ON activates the terminator for DV-bus

4.2

Setting of DIP-Switches

4.2.1

Setting of DIP-Switches for DV-bus application



DIP-Switch B24

Fig.20: DIP-Switch for DV-bus application

All DIP-Switches of B24 have to be switched to position “OFF”.

These switches are actually not used.

4.2.2

Setting of DIP-Switches for CAN-bus

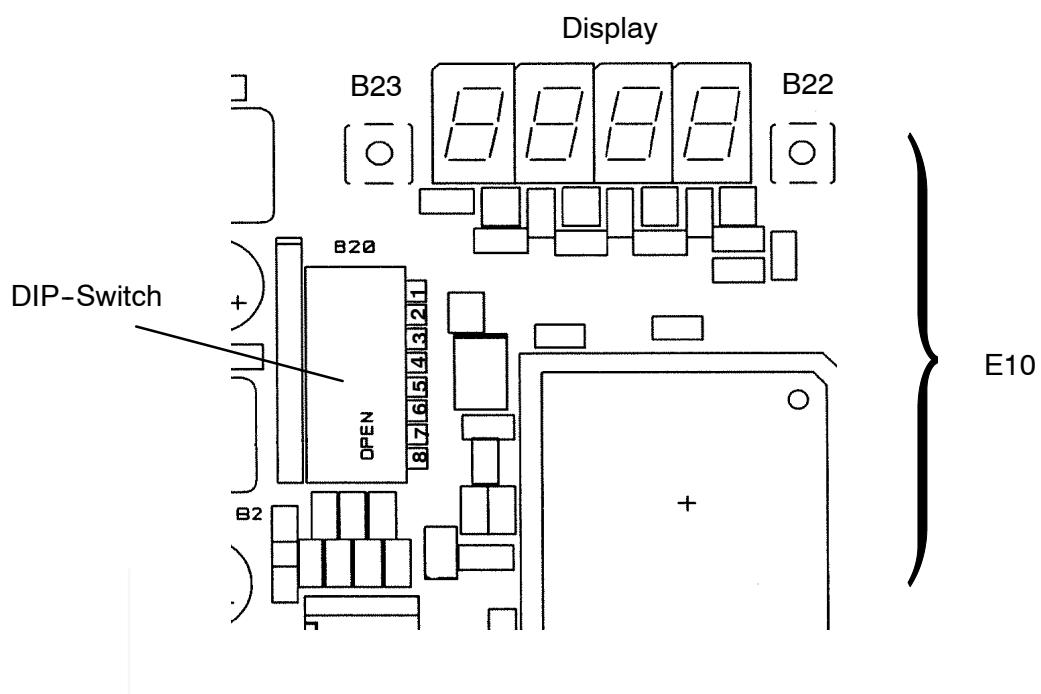
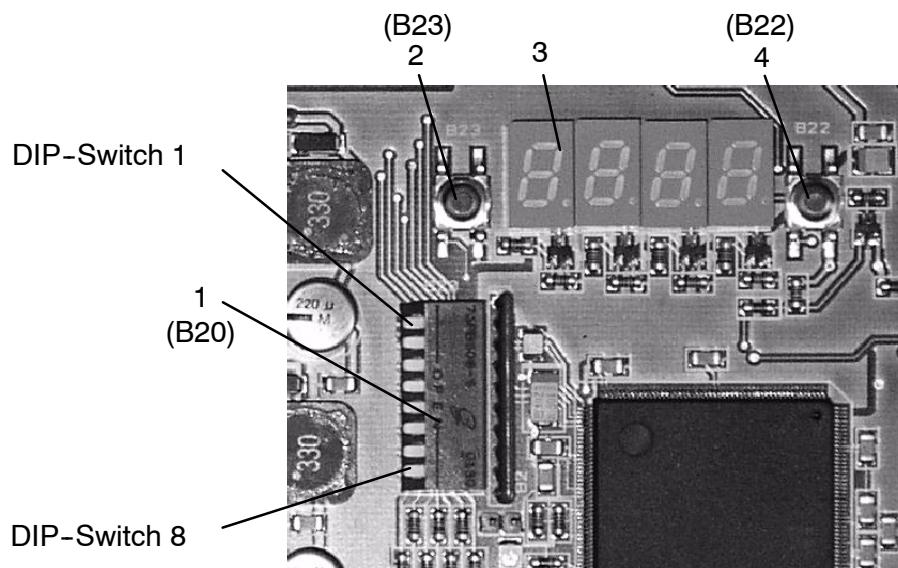


Fig.21: DIP-Switches, display and push buttons to select and adjust different operation modes

- 1 = DIP-Switch B20 with 8 single switches
- 2 = Push button B23 to select the modes within the respective DIP-Switch settings
- 3 = Display
- 4 = Push button B22 to set selected mode

4.2.3**General information in use of the DIP-Switch and push buttons**

The normal operation of the all DIP-Switches is the “DOWN”-position.

This means the respective switch is closed.

In the upper position the respective switch is open and by this, a mode can be selected and adjusted.

After a switch is set into the upper position, a mode can be selected by the the push button on the left of the display (push button B23).

Before setting the selected mode the display-information does not blink.

After acknowledgement of selected mode with the push button on the right of the display (push button B22) the display information is blinking – this means selected mode is set.

After setting a mode all switches have to be set into the down-position (exception CAN-bus address).

4.2.3.1**Setting of DV-bus address**

For DV-bus application in the meaning of information to distribution unit for DV-bus operation and DV-bus address for the distribution unit see manual no.: 3648 “Operator unit 130-613” under section “DV-bus application”.

4.2.3.2

Setting of CAN Bus address

Each device within a CAN bus application has to be identified with an address.

This address must not be twice within this application (bus-conflict)!!

The CAN bus address is already adjusted by the manufacturer.

Below mentioned procedure to adjust the address is only necessary if a second Distribution Unit should be connected.

To read out the CAN bus address it is only necessary to switch the DIP switches 1 and 2 into the upper position ("OPEN").

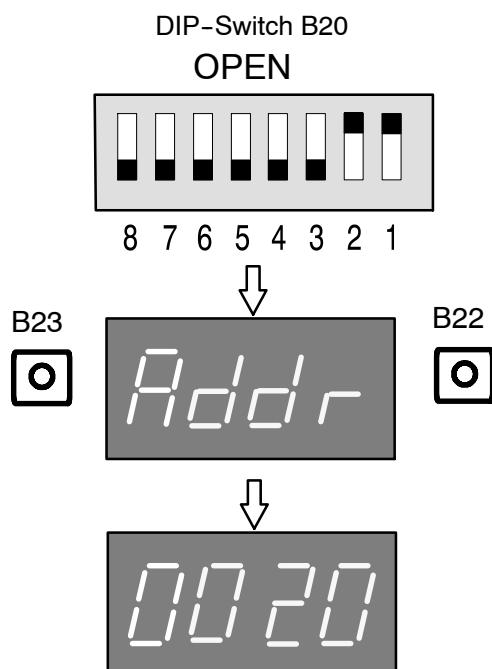


Fig.22: DIP-Switch position to adjust CAN-Bus address

Procedure:

- Switches 1 and 2 of the DIP-Switch into the upper position. Display = Addr
- Press push button B22 - the actual address will be shown in the display.
- With push button B23 the numbers will count up and with push button B22 the numbers will count down. The numbers will be shown in the display.

Switches 1 and 2 into the lower position after the final number of the CAN bus address is adjusted.

- Operate push button B21 "RESET Processor" (Fig.2/6) or
Switch off and on again the supply voltage to the Distribution Unit;
by this the address is set.

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Operate push button B21 "RESET Processor" (Fig.2/6) to acknowledge
or
Switch OFF an ON again voltage supply to the Distribution
Unit, by this the changed address is set.

Below mentioned table shows the CAN bus addressees for one or several Distribution Units.

Restrictions:

Address 00 must not be used!!

Device(s)	CAN-Bus-Address
Operator Units	01 to 09
Sensors (GPS-compass)	10 to 13
Sensors (Gyro Compass)	14 to 19
Distribution Units	20 to 29
Repeaters	30 to ...

4.2.3.3

Adjustment of the 8 output channels (12 output channels -> E10)

Each of the 8 (12) output channels can be set to 3 different interfaces.

These interfaces are: Course bus, NMEA1 and NMEA2.

With the formats NMEA1 and NMEA2 to different configurations can be adjusted, these configurations become active after selection (to the respective output channel).

For adjustment of this configurations see sections 4.2.3.4 .

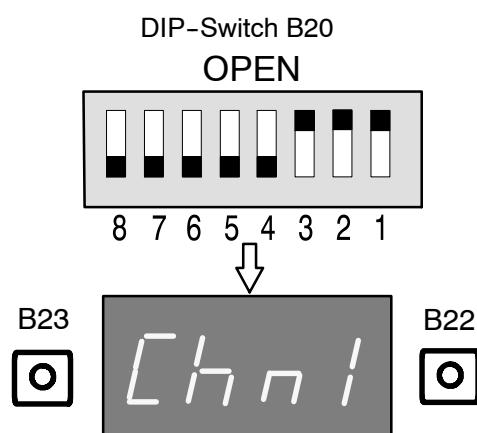


Fig.23: DIP-Switch position to adjust the 8 (12) output channels

Procedure:

- Switches 1, 2 and 3 of the DIP-Switch B20 into the upper position.
- By each operation of push button B23 another channel and/or another format referring to the selected channel is selected and displayed.
- This adjustment has to be performed for each connected channel.
- Each adjustment of a format has to be set by operating push button B22 (right side of the display). Set format blinks on the display.
- After adjustment of all connected channels, the DIP switches 1, 2 and 3 must be switched into the "DOWN" position again.

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Number of operations of the push button B23	Display	Interface format	Plug at the PCB	
after switching of switches 1, 2 and 3 (B20) into the upper position			Plug B23	
1x	HSEr	Course bus (red LED)		
2x	nME1	NMEA1 (green LED)		
3x	nME2	NMEA2 (blue LED)		
4x	Chn1		Plug B24	
5x	HSEr	Course bus (red LED)		
6x	nME1	NMEA1 (green LED)		
7x	nME2	NMEA2 (blue LED)		
8x	Chn2		Plug B25	
9x	HSEr	Course bus (red LED)		
10x	nME1	NMEA1 (green LED)		
11x	nME2	NMEA2 (blue LED)		
12x	Chn3		Plug B26	
13x	HSEr	Course bus (red LED)		
14x	nME1	NMEA1 (green LED)		
15x	nME2	NMEA2 (blue LED)		
16x	Chn4		Plug B27	
17x	HSEr	Course bus (red LED)		
18x	nME1	NMEA1 (green LED)		
19x	nME2	NMEA2 (blue LED)		
20x	Chn5		Plug B28	
21x	HSEr	Course bus (red LED)		
22x	nME1	NMEA1 (green LED)		
23x	nME2	NMEA2 (blue LED)		
24x	Chn6		Plug B29	
25x	HSEr	Course bus (red LED)		
26x	nME1	NMEA1 (green LED)		
27x	nME2	NMEA2 (blue LED)		
28x	Chn7		Plug B30	
29x	HSEr	Course bus (red LED)		
30x	nME1	NMEA1 (green LED)		
31x	nME2	NMEA2 (blue LED)		
32x	Chn8		Plug B31	E10
33x	HSEr	Course bus (red LED)		E10
34x	nME1	NMEA1 (green LED)		E10
35x	nME2	NMEA2 (blue LED)		E10
36x	Chn9		Plug B32	E10
37x	HSEr	Course bus (red LED)		E10
38x	nME1	NMEA1 (green LED)		E10
39x	nME2	NMEA2 (blue LED)		E10
40x	Chn10		Plug B33	E10
41x	HSEr	Course bus (red LED)		E10
42x	nME1	NMEA1 (green LED)		E10
43x	nME2	NMEA2 (blue LED)		E10
44x	Chn11		Plug B34	E10
45x	HSEr	Course bus (red LED)		E10
46x	nME1	NMEA1 (green LED)		E10
47x	nME2	NMEA2 (blue LED)		E10
48x	Chn1		Plug B23	

4.2.3.4

Adjustments of NMEA Formats



The Distribution Unit can provide for each output one of three different data formats (Course bus, NMEA1 and NMEA2). Selected format can be recognized by the respective LED colour.

The content of the course bus format cannot be changed, but both NMEA formats can be adjusted concerning to telegram-type and repetition rate.

Procedure for NMEA1:

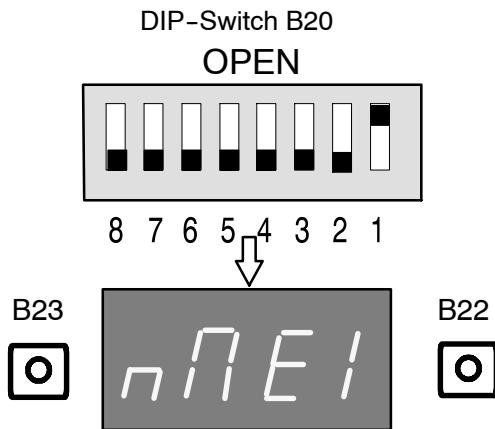


Fig.24: DIP-Switch position to adjust the NMEA1 interface

- Switch 1 of the DIP-Switch into the upper position.

Operation of push button B23	Display	Interface
after switching (B20) switch 1 into the upper position	nME1	NMEA Channel1
1x	nME1.0	NMEA 1.0sec
2x	nME0.1	NMEA 0.1sec
3x	EHdT	EHdT-Telegram
4x	CHdT	CHdT-Telegram
5x	IHdG	HCHDG-Telegram
6x	IroT	TIROT-Telegram*
7x	EroT	HEROT-Telegram*

*Adjustment of turn rate see section 4.2.3.7

Meaning of the telegram abbreviations:

HEHDT = Heading corrected, from a Gyro compass
HCHDT = Heading corrected, from a Magnetic compass
HCHDG = Heading uncorrected from a Magnetic compass
TIROT = Turn rate from a turn rate sensor
HEROT = Turn rate from a Gyro compass

- By each operation of push button B23 another format is selected and displayed.
- Each adjusted format has to be set with push button B22 (right of the display).
The set format information blinks at the display.
- After adjustment of all connected channels, the switch 1 has to be set into lower position.



HCxxx-telegrams contain heading from magnetic compass. Not all heading-receivers are allowed to use this heading source.
Telegramtype "HC" are transmitted from the respective channel also, when a Gyro is selected at the connected Operation Unit.

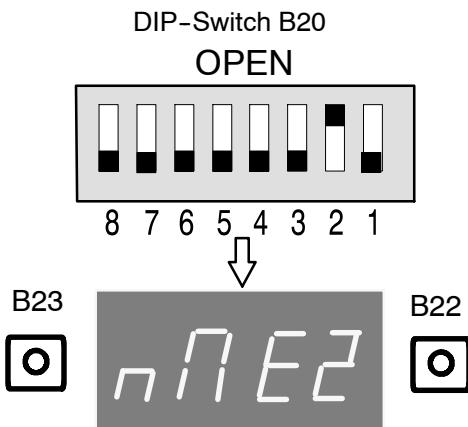
Procedure for NMEA2:

Fig.25: DIP-Switch position to adjust the NMEA2 interface

- Switch 2 of the DIP-Switch into the upper position.

Operation of push button B23	Display	Interface
after switching (B20) switch 2 into the upper position	nME2	NMEA Channel2
1x	nME1.0	NMEA 1.0sec
2x	nM0.1	NMEA 0.1sec
3x	EHdT	HEHDT-Telegram
4x	CHdT	HCHDT-Telegram
5x	IHdG	HCHDG-Telegram
6x	IroT	TIROT-Telegram*
7x	EroT	HEROT-Telegram*

*Adjustment of turn rate see section 4.2.3.7

Meaning of the telegram abbreviations:

HEHDT = Heading corrected, from a Gyro compass

HCHDT = Heading corrected, from a Magnetic compass

HCHDG = Heading uncorrected from a Magnetic compass

TIROT = Turn rate from a turn rate sensor

HEROT = Turn rate from a Gyro compass

- By each operation of push button B23 another format is selected and displayed.
- Each adjusted format has to be set with push button B22 (right of the display).
The set format information blinks at the display.
- After adjustment of all connected channels, the switch 2 has to be set into lower position.

Please note:

Restrictions for NMEA channel 1 and NMEA channel 2.

On selection of NMEA repetition rate of 1 second, all selected telegrams can be transmitted.

But on selection of NMEA repetition rate of 0.1 second, only 2 selected telegrams can be transmitted.

More than 2 telegrams are not selectable at a repetition rate of 0.1 second.



HCxxx-telegrams contain heading from magnetic compass. Not all heading-receivers are allowed to use this heading source.
Telegramtype "HC" are transmitted from the respective channel also, when a Gyro is selected at the connected Operation Unit.

4.2.3.5

Adjustment of NMEA Formats (E10)



The Distribution Unit can provide for each output one of three different data formats (Course bus, NMEA1 and NMEA2). Selected format can be recognized by the respective LED colour.

The content of the course bus format cannot be changed, but both NMEA formats can be adjusted concerning to telegram-type and repetition rate.

Procedure for NMEA1:

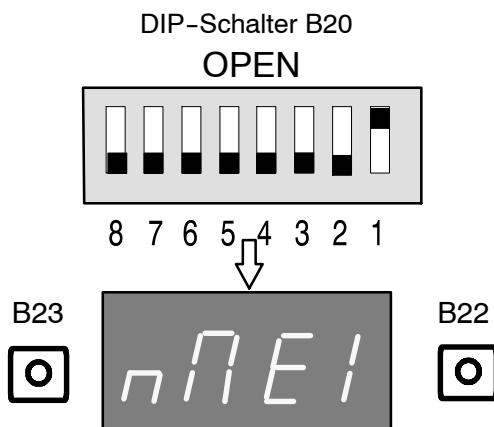


Fig.26: DIP-Switch position to adjust the NMEA1 interface

- Switch 1 of the DIP-Switch into the upper position.

Number of operations of push button B23	Display	Baudrate	Interface
after switching switch 1 (B20) into the upper position	nME1		NMEA Channel 1
1x	CY. 1	4800Bd	NMEA 1.0sec
2x	CY.10	4800Bd	NMEA 0.1sec
3x	cY.10	9600Bd	NMEA 0.1sec
4x	CY.50	38,4kBd	NMEA 0.02sec
5x	EHdT		EHdT-Telegram
6x	CHdT		CHdT-Telegram
7x	IHdG		CHdG-Telegram
8x	IroT		TIoT-Telegram*
9x	EroT		HERoT-Telegram*

* to adjust the turn rate, see section 4.2.3.7

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Meaning of the telegram abbreviations:

CY and cY means "Cycle"

CY1 = 1Hz

CY10 = 10Hz

CY50 = 50Hz

HEHDT = Heading corrected, from a Gyro compass

HCHDT = Heading corrected, from a Magnetic compass

HCHDG = Heading uncorrected from a Magnetic compass

TIROT = Turn rate from a turn rate sensor

HEROT = Turn rate from a Gyro compass

- By each operation of push button B23 another format is selected and displayed.
- Each adjusted format has to be set with push button B22 (right of the display).
The set format information blinks at the display.
- After adjustment of all connected channels, the switch 1 has to be set into lower position.



HCxxx-telegrams contain heading from magnetic compass. Not all heading-receivers are allowed to use this heading source.

Telegramtype "HC" are transmitted from the respective channel also, when a Gyro is selected at the connected Operation Unit.

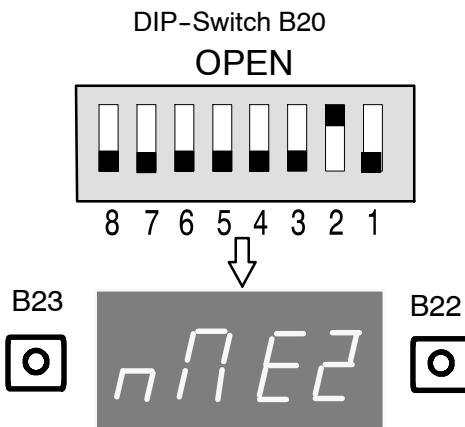
Procedure for NMEA2:

Fig.27: DIP-Switch position to adjust the NMEA2 interface

- Switch 2 of the DIP-Switch into the upper position.

Number of operations of push button B23	Display	Baudrate	Interface
after switching switch 2 (B20) into the upper position	nME1		NMEA Channel 2
1x	CY.1	4800Bd	NMEA 1.0sec
2x	CY.10	4800Bd	NMEA 0.1sec
3x	cY.10	9600Bd	NMEA 0.1sec
4x	CY.50	38,4kBd	NMEA 0.02sec
5x	EHdT		EHdT-Telegram
6x	CHdT		CHdT-Telegram
7x	IHdG		CHdG-Telegram
8x	IroT		TIoT-Telegram*
9x	EroT		HERoT-Telegram*

* to adjust the turn rate, see section 4.2.3.7

Meaning of the telegram abbreviations:

CY and cY means "Cycle"

CY1 = 1Hz

CY10 = 10Hz

CY50 = 50Hz

HEHDT = Heading corrected, from a Gyro compass

HCHDT = Heading corrected, from a Magnetic compass

HCHDG = Heading uncorrected from a Magnetic compass

TIROT = Turn rate from a turn rate sensor

HEROT = Turn rate from a Gyro compass

- By each operation of push button B23 another format is selected and displayed.
- Each adjusted format has to be set with push button B22 (right of the display).
The set format information blinks at the display.
- After adjustment of all connected channels, the switch 1 has to be set into lower position.

Please note:

Restrictions for NMEA channel 1 and NMEA channel 2.

On selection of NMEA repetition rate of 1 second, all selected telegrams can be transmitted.

But on selection of NMEA repetition rate of 0.1 second, only 2 selected telegrams can be transmitted.

More than 2 telegrams are not selectable at a repetition rate of 0.1 second.



HCxxx-telegrams contain heading from magnetic compass. Not all heading-receivers are allowed to use this heading source.
Telegramtype "HC" are transmitted from the respective channel also, when a Gyro is selected at the connected Operation Unit.

Distribution Unit

138-118



**DISTRIBUTION
UNIT**

4.2.3.6

Left blank

4.2.3.7

Scaling of RoT Output

For the RoT-output an adjustment of the turn rate has to be performed.

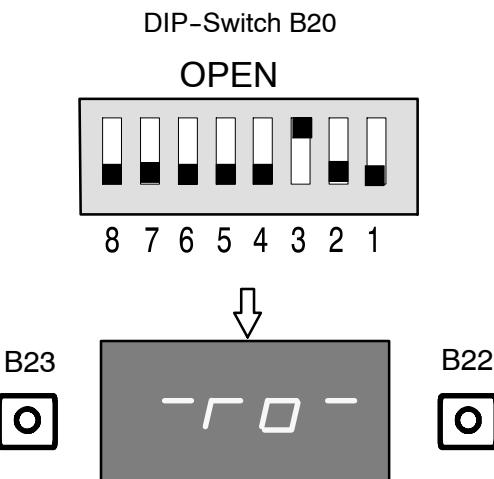


Fig.28: DIP-Switch position to adjust the turn rate

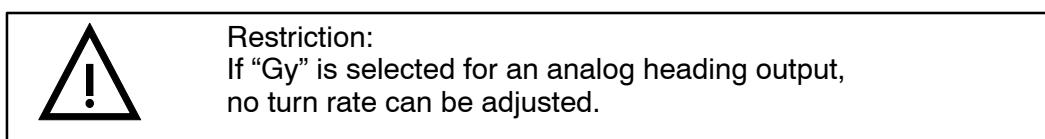
Procedure:

- Switch 3 of the DIP-Switch into the upper position.

Operation of push button B23	Display	Rate of Turn
after switching (B20) switch 3 into the upper position	-ro-	
1x	r 30	30 degree/minute
2x	r100	100 degree/minute
3x	r300	300 degree/minute
4x	Gy	analog heading output*

*Selection of "Gy" means: there is no RoT-function, the output is used for an analogue heading signal.

- By each operation of push button B23 another rate of turn range is selected and displayed.
- Each adjusted rate has to be set with push button B22 (right of the display). The set format information blinks at the display.
- After adjustment, the switch 3 has to be set into lower position.



To test this function (RoT with 20°/minute) see manual for the compass STD 22.

4.2.3.8

Selection of magnetic compass

DIP-Switch B20

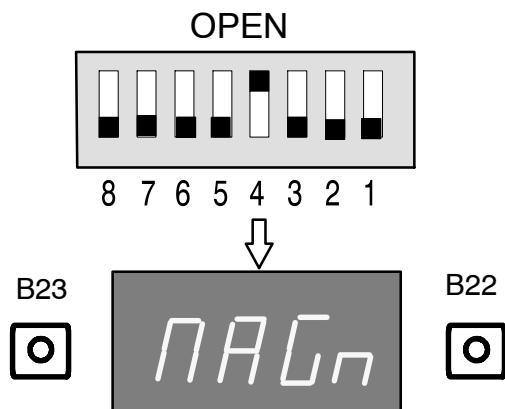


Fig.29: DIP-Switch position to adjust application with Magnetic compass

With this adjustment it is to determine if a magnetic compass is connected to this application.

- Switch 4 of the DIP-Switch (B23) into the upper position.
- The display shows MAGn.
If this display-information blinks, then it is selected and the distribution unit is prepared to support a magnetic compass.
- By operating the push button B22 (right side) the selection is aborted. The display information does not blink.
- After adjustment, the switch 4 has to be set into lower position.



If a magnetic compass is connected to the Distribution Unit and the setting is already performed, then the Operation Unit recognized the magnetic compass automatically.
But, if an external sensor as the magnetic sensor is disconnected (de-installation), a POWER OFF/POWER ON procedure has to be performed at the Operation Unit (as a RESET).

4.2.3.9

Displaying heading or speed information

This setting allows to check the heading information of selected sensor, the speed information of the Log or information about supply voltages.

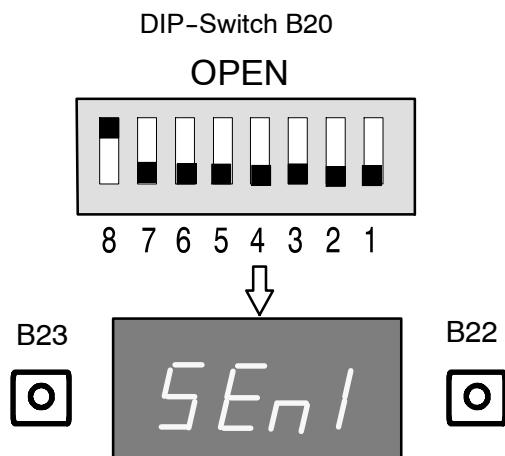


Fig.30: DIP-Switch position to adjust output of heading and speed values

Procedure:

Operation of push button B23	Display	Heading information
after switching switch 8 (B20) into the upper position	Sen1	xxx.x°*
1x	Sen2	xxx.x°*
2x	Sen3	xxx.x°*
3x	Sen4	xxx.x°*
4x	PLoG	+/-Kts no information with DV-bus application
5x	P-11	11VDC supply voltage of the I/O PCB
6x	P-35	35VDC operating voltage for the 1/6 Step function of the I/O PCB

* Designations of SEN1 to SEN4 depends on the respective CAN bus address.

The lowest address is SEN1

- Switch 8 of the DIP-Switch into the upper position.
- By operating the push button B22 (right side) the display shows the heading value (the speed or supply voltage) of the selected sensor (see table above).
- After this check, the switch 8 has to be set into lower position.



5

Switching OFF the Distribution Unit

By switching OFF the supply voltage, the distribution unit is switched OFF.

All direct connected devices to the Distribution Unit, as there are compass and repeaters with supplied voltage are switched off as well.

A separate switching off of the Distribution Unit is not possible.

6

Adjustments

6.1

Adjustment of magnetic sonde



This adjustment should be performed only by well trained technicians.

Necessary tools and measuring instruments

- Screw driver to adjust potentiometer
- Voltmeter
- Iron tool to influence the magnetic sonde

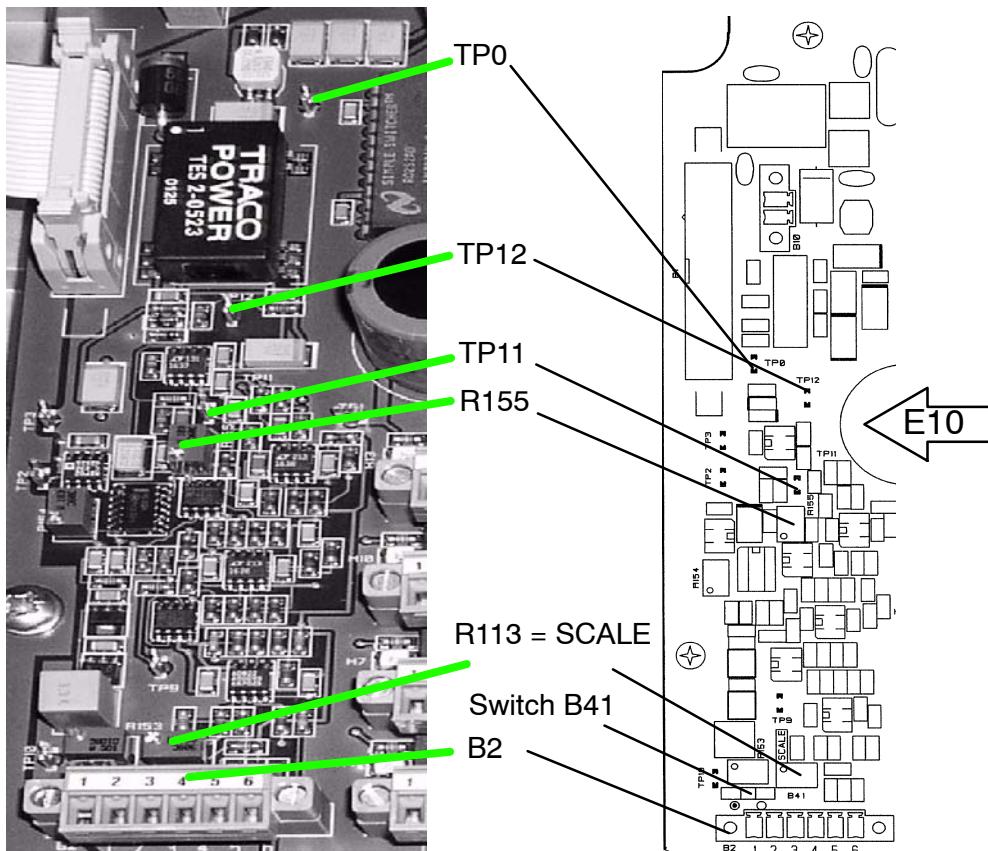


Fig.31: Testpoint at the I/O PCB to adjust the magnetic sonde



Switch B41 has to be closed always. Switch position to the left.

Adjustment after installation of the magnetic sonde

(see Fig.31)

The Distribution Unit is in operation.

Magnetic sonde is installed and connected to the Distribution Unit.

- Switch the switches 6,7 and 8 of the DIP switch B20 into the upper position "OPEN").
- Operate push button B22 until the display shows "MAGS".
- Operate push button B23 once; the actual heading of the magnetic sonde is displayed.
- Measure the voltage at plug B2, there should be a voltage of $1,8V_{eff}$ (400Hz) between pin 2.1 and 2.2 .
- Connect voltmeter (DC-range) at TP 11 or TP 12 (+) and TP0 (GND) at the I/O PCB.
- Turn the magnetic sonde (in the holder) until a value between 4.3V and 4.6V is displayed at the voltmeter.
- If the voltage is less than 4.3V or higher than 4.6V, than the requested voltage has to be adjusted with potentiometer R155 to a value between 4.3V and 4.6V.
- If this value cannot be adjusted by potentiometer R155 (display in the Distribution Unit shows "Err"), the distance between magnetic compass and sonde has to be reduced. After that the voltage adjustment must be repeated until the heading value is displayed (not "Err").
- After the voltage adjustment, the magnetic sonde has to be adjusted in that way, that the display in the Distribution Unit shows the same heading value than the magnetic compass.

If the potentiometer R113 is adjusted inadvertently

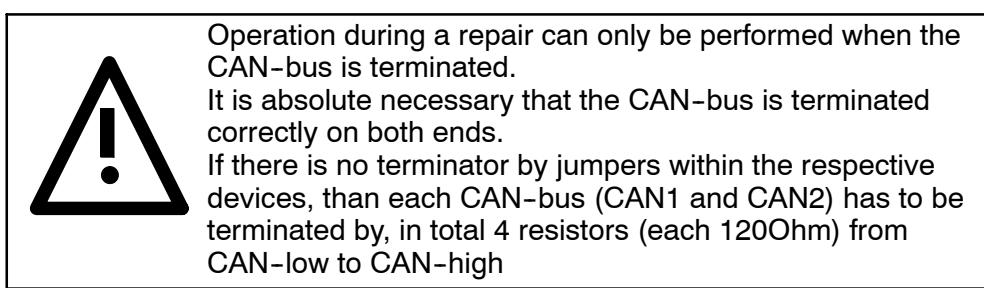
- Divert the compass card into position 45° by an iron tool.
- Voltage measurement at TP11 (+) and TP0 (GND)
and
Voltage measurement at TP12 (+) and TP0 (GND)
Both values must be the same.
- If applicable adjust potentiometer R113, so that both values are the same.

Maintenance and Repair

The Distribution Unit is maintenance free.

A repair is constrained to the exchange of the PCB's:

I/O PCB	Identnumber	138-118.101
		138-118.101 E10
Interface PCB	Identnumber	138-118.103
		138-118.100 E10



Faults within the connected compass are not indicated. The have to be researched at the display of the respective compass.

7.1

Error indication

An error is displayed by a blinking "ERRO".



Fig.32: Error display at the Distribution Unit

Operate the push button B23 during an error is displayed.
Two different information can be displayed after that.

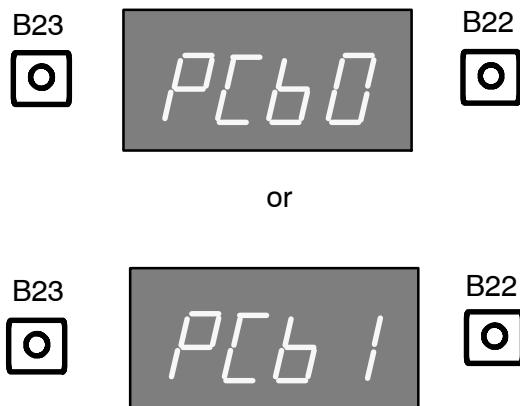


Fig.33: Display to determine an error

Error indication "PCB0" points to a faulty Interface PCB, an error indication "PCB1" points to a faulty I/O PCB.

Measures to continue determination of the error source:

PCB0

Operate both push buttons B23 and B22 at the same time.

Display = "Er.01" means: Interface PCB faulty.

Display = "Er.02" means: Interface PCB or I/O PCB or both PCB's faulty.
CAN-bus dialogue disturbed.

PCB1

Operate both push buttons B23 and B22 at the same time.

Display = "Er.01" means: I/O PCB faulty.

Supply voltage for the step output faulty

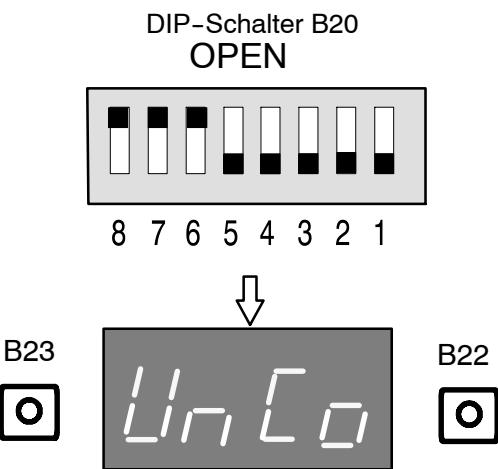
Display = "Er.02" means: I/O PCB faulty.
Internal voltage supply faulty.

Functional description of DIP switch settings in the Service mode

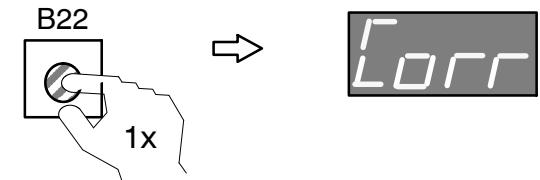
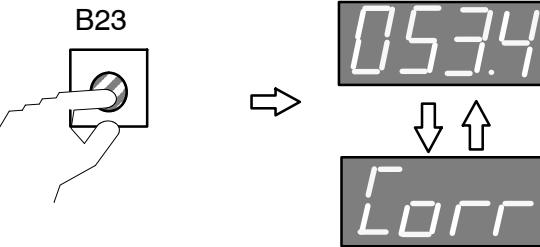
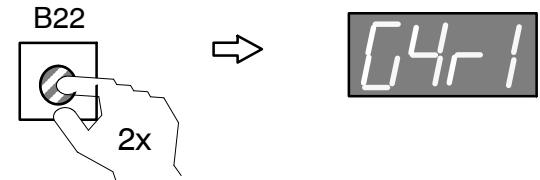
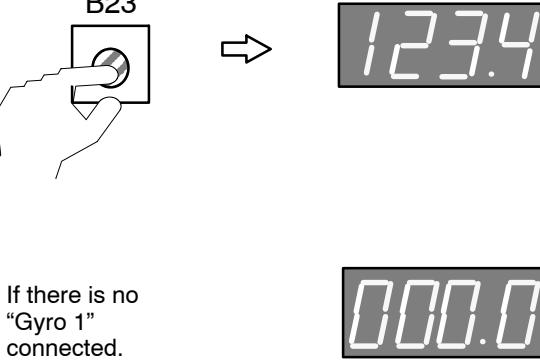
All data stated below should be selected and read out for servicing purposes only.

In standard operation the following data has no significance.

The Service Mode is switched ON with DIP-Switches 6+,7 and 8 into the upper position.

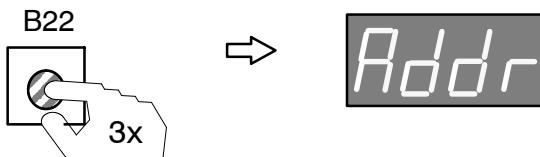
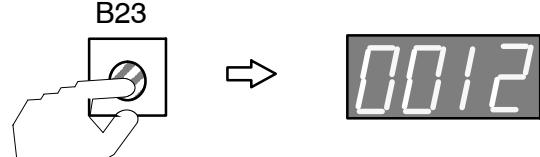
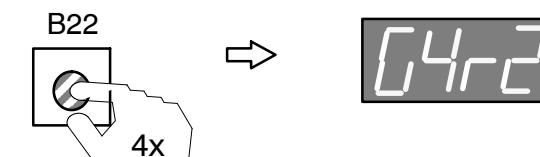
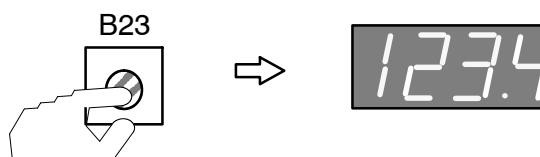


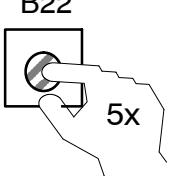
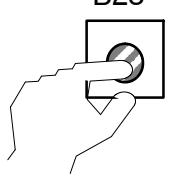
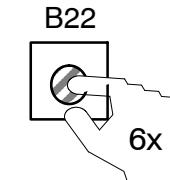
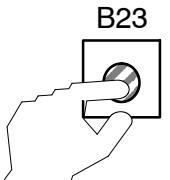
Seq. No.	Indications	Comments, Notes
1	<p>UnCo = (Uncorrected <u>Compass</u>) = heading without speed error correction value.</p> <p>DIP-Switch B20: positions 6,7 and 8</p> <p></p>	<p>Displays the un-corrected gyro heading</p> <p></p> <p></p>

Seq. No.	Indications	Comments, Notes
2	<p>Corr = <u>Corrected course</u> (course taking SEC into account)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 
3	<p><u>GYr1</u> = Displays corrected heading for Gyro compass 1</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>If there is no "Gyro 1" connected.</p>

Distribution Unit

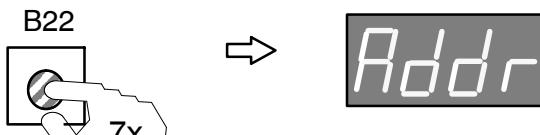
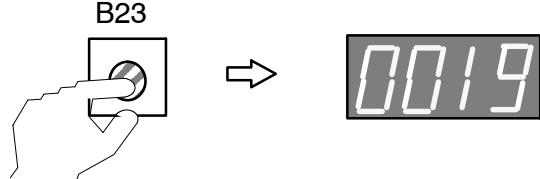
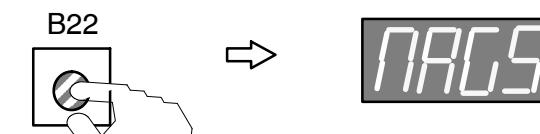
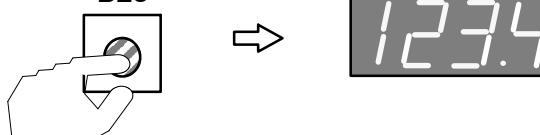
138-118

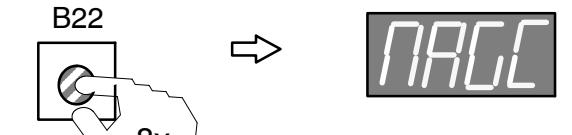
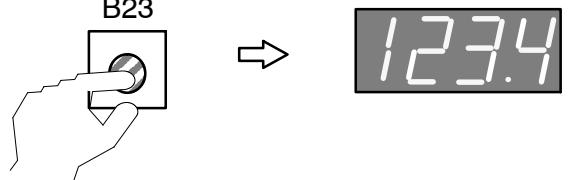
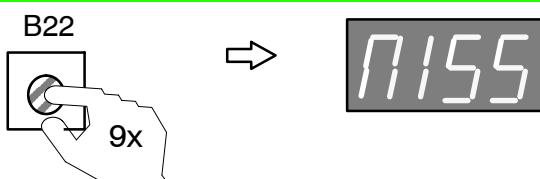
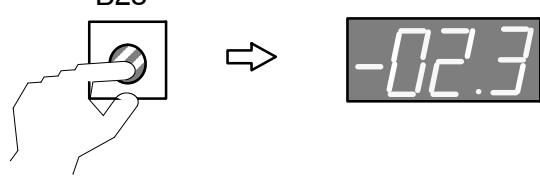
Seq. No.	Indications	Comments, Notes
4	<p><u>Addr</u> = Displays CAN-bus address for Gyro Compass 1</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>B22</p> <p>3x</p>  <p>B23</p> <p>If there is no "Gyro 1" connected.</p> 
5	<p>GYr2 = Displays corrected heading for Gyro compass 2</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>B22</p> <p>4x</p>  <p>B23</p> <p>If there is no "Gyro 2" connected.</p> 

Seq. No.	Indications	Comments, Notes
6	<u>Addr</u> = Displays CAN-bus address for Gyro Compass 2 DIP-Switch B20: positions 6,7 and 8	     <p>If there is no "Gyro 2" connected.</p>
7	<u>GYr3</u> = Displays corrected heading for Gyro compass 3 DIP-Switch B20: positions 6,7 and 8	     <p>If there is no "Gyro 3" connected.</p>

Distribution Unit

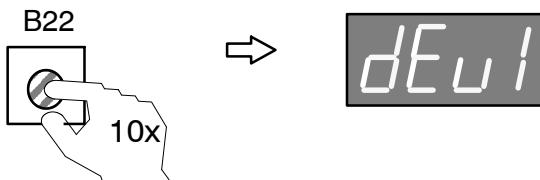
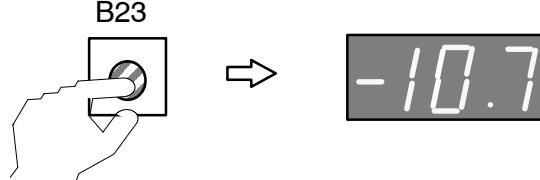
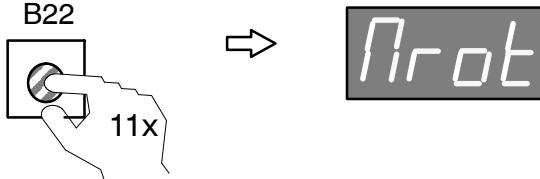
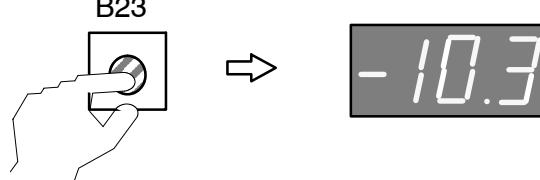
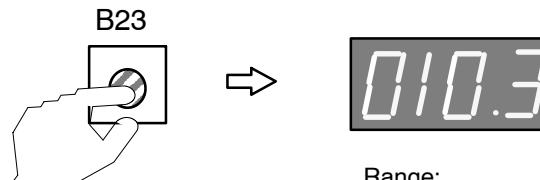
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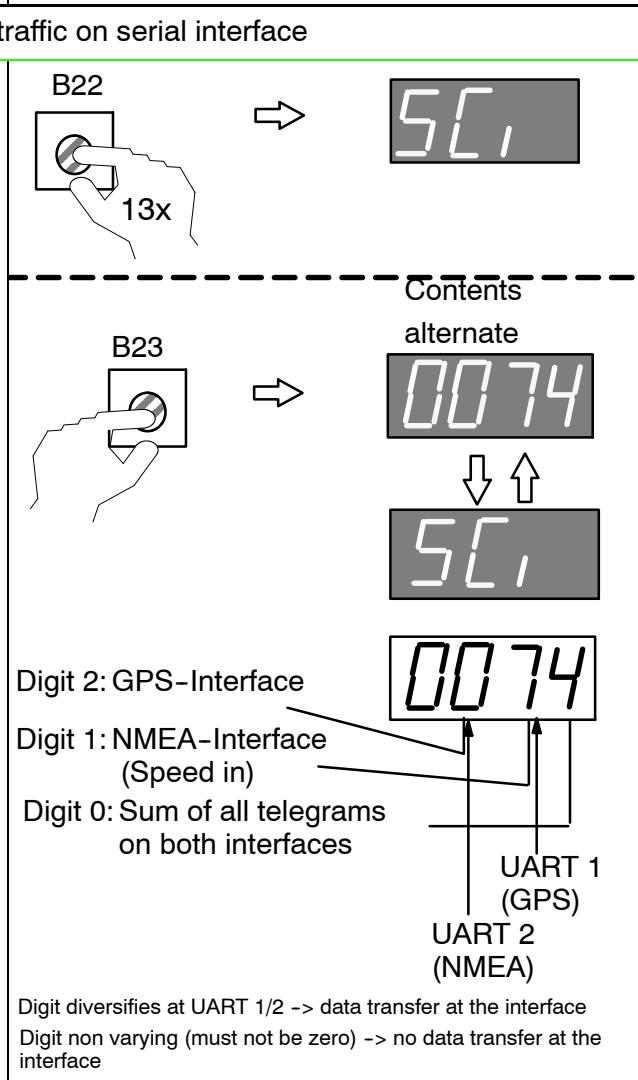
Seq. No.	Indications	Comments, Notes
8	<u>Addr</u> = Displays CAN-bus address for Gyro Compass 3 DIP-Switch B20: positions 6,7 and 8	  If there is no "Gyro 3" connected. 
9	<u>MAGS</u> = Displays heading of magnetic compass DIP-Switch B20: positions 6,7 and 8	  No heading available or heading of mag- netic compass faulty No magnetic compass connected  

Seq. No.	Indications	Comments, Notes
10	<p><u>MAGC</u> = Displays corrected heading or magnetic compass Deviation and variation included</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>No heading available or heading of magnetic compass faulty</p> <p>No magnetic compass connected</p>
11	<p><u>MISS</u> = Displays Variation value</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 

Distribution Unit

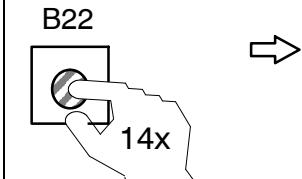
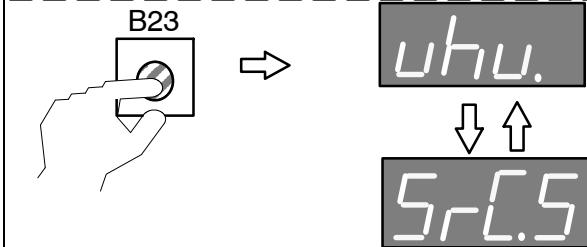
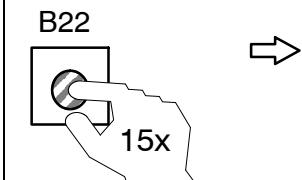
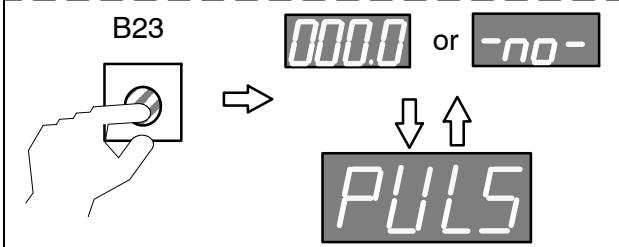
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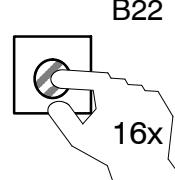
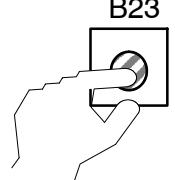
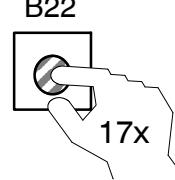
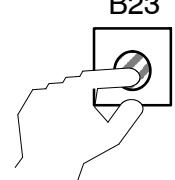
Seq. No.	Indications	Comments, Notes
12	<p><u>dEvl</u> = Displays deviation value Value out of an internal table, respective to the actual magnetic compass heading</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 
13	<p><u>Mrot</u> = Displays Rate of Turn of the magnetic compass</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>Display : Degree per minute Sign negative: Direction Port</p>
14	<p><u>V-M</u> = Displays this speed, which is manually set at the Operator Unit</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>Range: -90.0....90.0</p>

Seq. No.	Indications	Comments, Notes
15	<p><u>SCi</u> = Serial Interface, telegram traffic on serial interface</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>B22</p> <p>13x</p> <p>B23</p> <p>Contents alternate</p> <p>0074</p> <p>5L1</p> <p>5L1</p> <p>Digit 2: GPS-Interface</p> <p>Digit 1: NMEA-Interface (Speed in)</p> <p>Digit 0: Sum of all telegrams on both interfaces</p> <p>UART 1 (GPS)</p> <p>UART 2 (NMEA)</p> <p>Digit diversifies at UART 1/2 -> data transfer at the interface Digit non varying (must not be zero) -> no data transfer at the interface</p>

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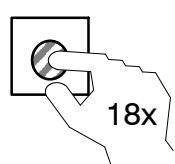
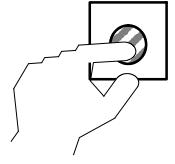
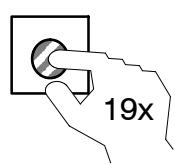
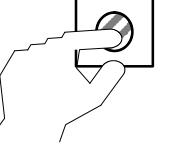
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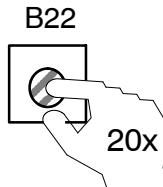
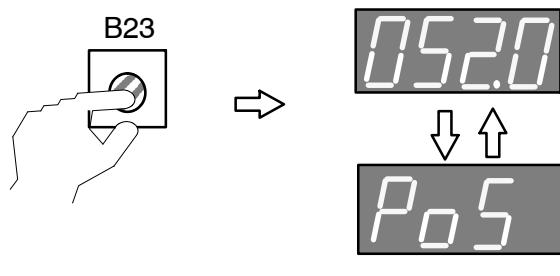
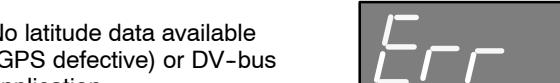
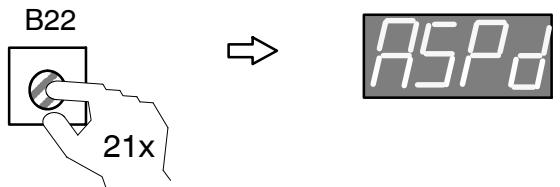
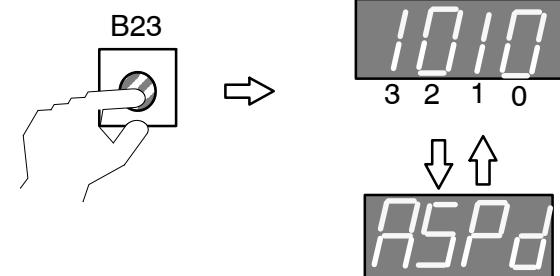
Seq. No.	Indications	Comments, Notes
16	<p><u>SrC.S</u> = Source of Speed Information Data about the source providing the speed value</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>Display options:</p>  <p> PULS = Puls log* vTg = Speed over ground vhW = Speed through water (vtG and vhW corresponds to NMEA 0183) *also shown in DV-bus application </p>
17	<p><u>PULS</u> = Speed value from puls log Indicated in Kts Displays -no- if no pulse log selected or connected Displays 0000 if there is no input from selected source Display range - 80Kts to + 80 Kts (astern and ahead)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 

Seq. No.	Indications	Comments, Notes
18	<p><u>vtG.S</u> = Speed from GPS-telegram (speed over ground)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>→</p>    <p>No telegram, DV-bus application or faulty data from GPS (vTg-telegram)</p> 
19	<p><u>vtG.h</u> = Course value from GPS telegram</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>→</p>    <p>No telegram, DV-bus application, or faulty data from GPS (vTg-telegram)</p> 

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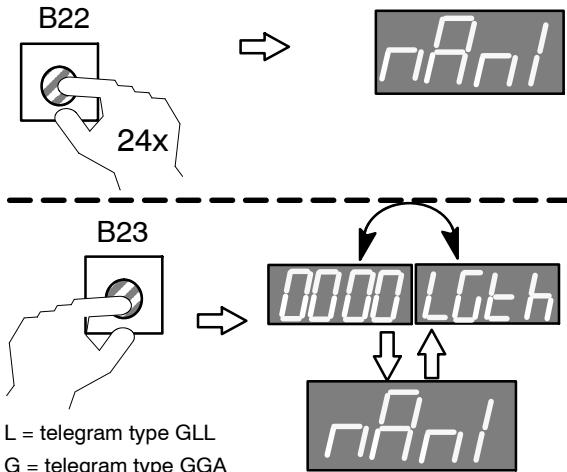
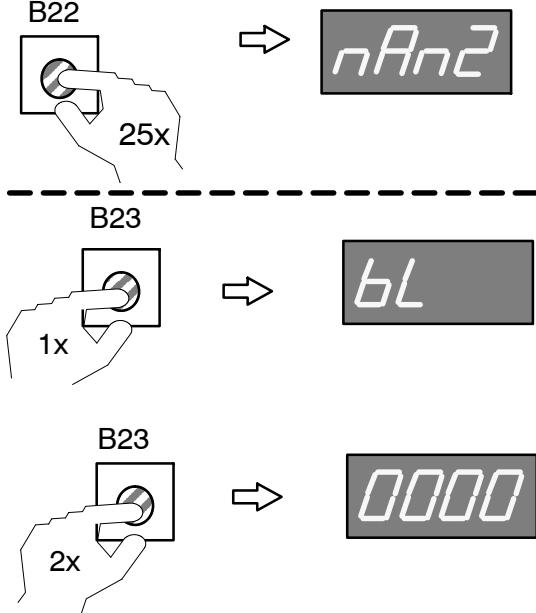
Seq. No.	Indications	Comments, Notes
20	<p><u>vhw</u> = Speed value in knots from NMEA telegram (speed through water)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p>  <p>→</p>  <p>B23</p>  <p>→</p>   <p>No telegram, DV-bus application, or faulty serial speed data (vHw-telegram)</p> 
21	<p><u>SPd.A</u> = Speed in knots (actual value) (or value from DV-bus) The speed for which the source has been selected, is displayed.</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p>  <p>→</p>  <p>B23</p>  <p>→</p>  <p>In case of a fault the last actual speed is displayed.</p>

Seq. No.	Indications	Comments, Notes
22	<u>PoS</u> = Position - latitude in degrees DIP-Switch B20: positions 6,7 and 8 Automatic latitude from GPS or actual latitude from the DV bus	   No latitude data available (GPS defective) or DV-bus application
23	<u>ASPD</u> = <u>Alarm Speed</u> DIP-Switch B20: positions 6,7 and 8	 
	Digit 3 "Speed OK" Digit 2 " Speed Alarm" Digit 1 "Auto Speed OK" Digit 0 " Auto Alarm"	Display 1 Speed OK Display 0 Speed not OK Display 1 Speed Alarm Display 0 No Speed Alarm Display 1 Auto Speed OK Display 0 Auto Speed not OK Display 1 Auto Speed OK Display 0 No Auto Speed Alarm

Distribution Unit

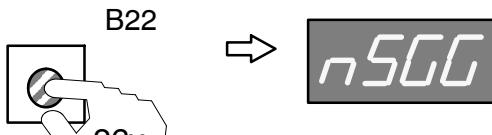
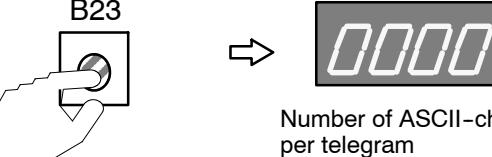
138-118

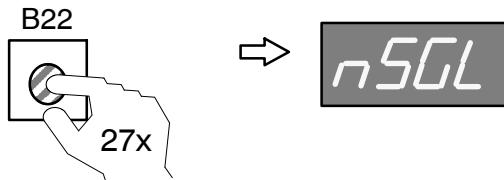
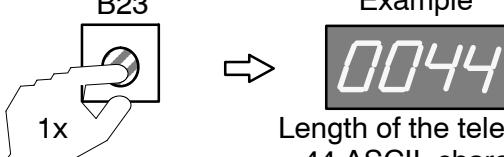
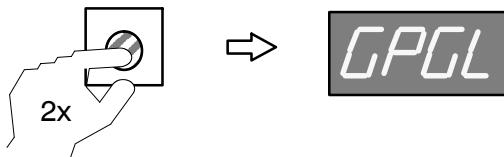
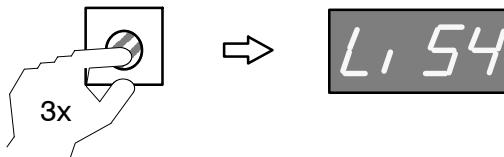
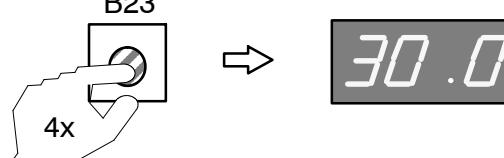
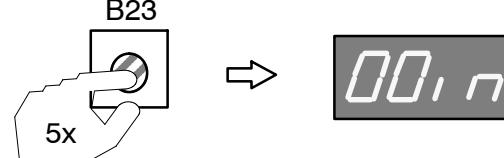
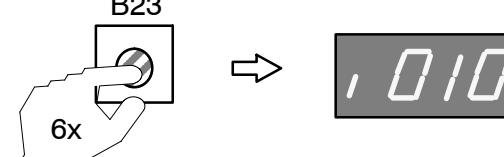
Seq. No.	Indications	Comments, Notes
24	<p><u>PoS</u>n = Latitude value derives from automatic latitude input. Indicated in degrees</p> <p>DIP-Switch B20: positions 6,7 and 8</p> <p>Actual latitude (or manual set latitude value) or automatic latitude from the DV bus</p>	<p>B22</p> <p>22x</p> <p>B23</p> <p>23x</p> <p>In case of a fault, the last actual latitude is displayed.</p>
25	<p><u>APoS</u> = Alarm position input</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p> <p>23x</p> <p>B23</p> <p>0001 1100</p> <p>0001 = no position (alarm) 1100 = position o.k.</p> <p>APoS</p>

Seq. No.	Indications	Comments, Notes
26	<p><u>nAn1</u> = 1st table for NMEA-requests</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>B22 24x</p> <p>B23</p> <p>L = telegram type GLL G = telegram type GGA t = telegram type VTG h = telegram type VHW 1st digit = number of L-types 2nd digit = number of G-types 3rd digit = number of t-types 4th digit = number of h-types</p>
27	<p><u>nAn2</u> = 2nd table for NMEA-requests</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>B22 25x</p> <p>B23 1x</p> <p>B23 2x</p> <p>b = telegram type VBW l = telegram type SLL 1st digit = number of b-types 2nd digit = number of l-types</p>

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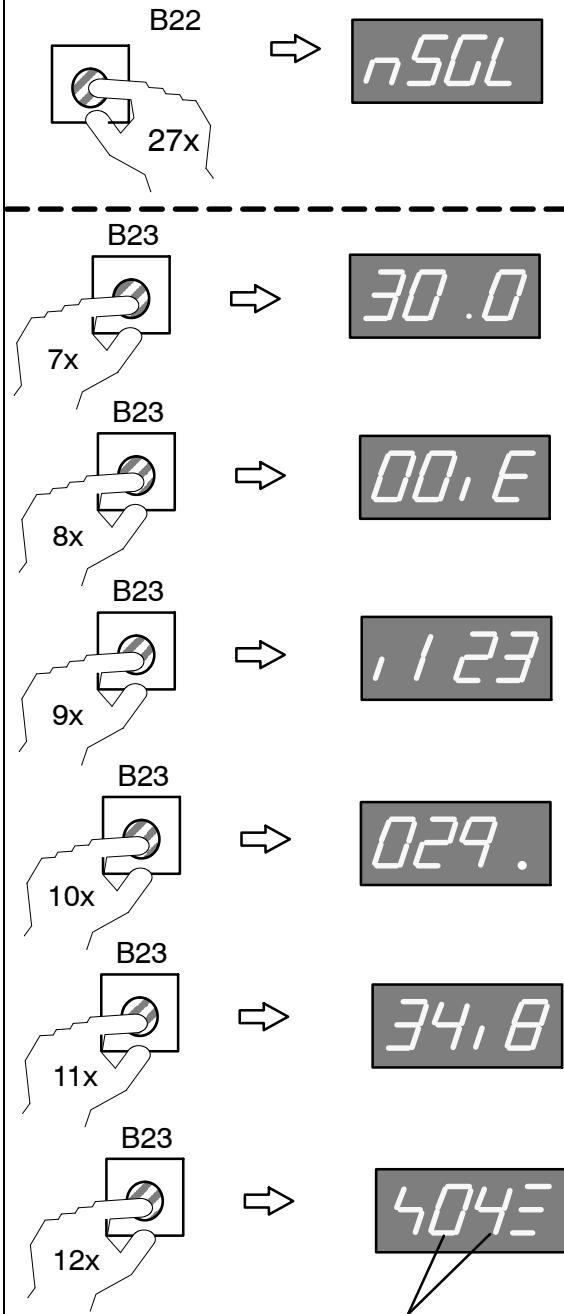
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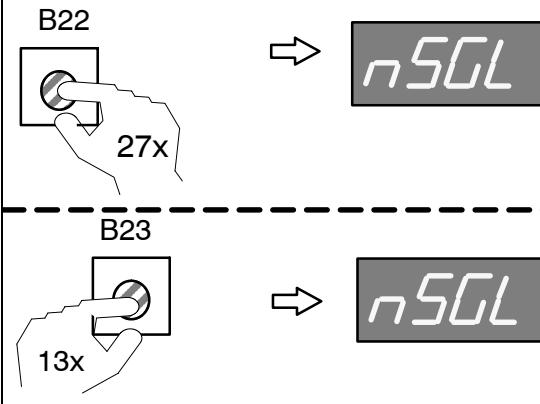
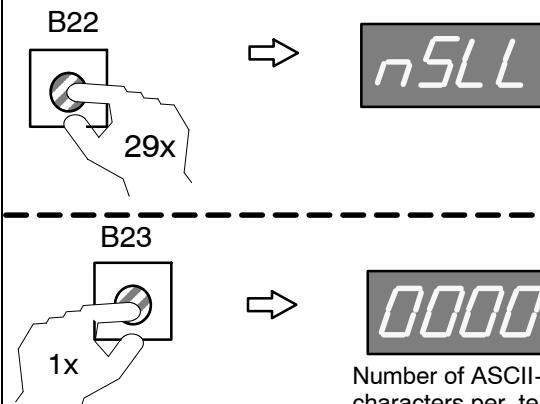
Seq. No.	Indications	Comments, Notes
28	<p><u>nSGG</u> = NMEA-telegram (strings of the GGA-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p>  <p>B23</p>  <p>Number of ASCII-characters per telegram 0000 = no telegram</p> <p>The number of operations depends on the number of characters. (1 display content = max. 4 ASCII-characters)</p> <p>See sequ. no. 29</p>

Seq. No.	Indications	Comments, Notes
29	<p><u>nSGL</u> = NMEA-telegram (String of the GLL-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>Example</p>      

Distribution Unit

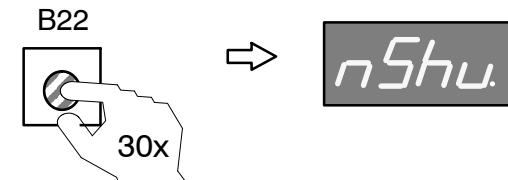
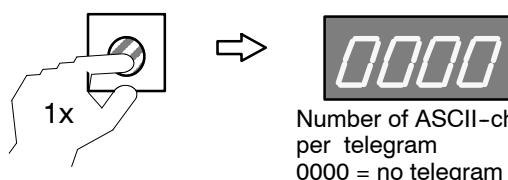
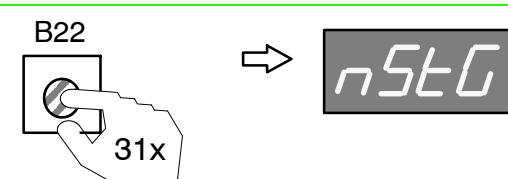
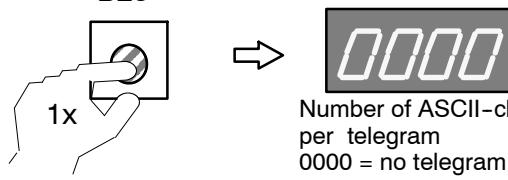
138-118

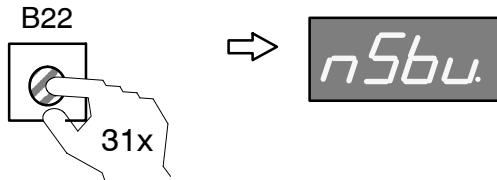
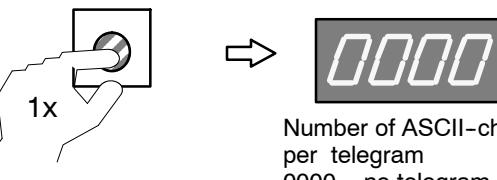
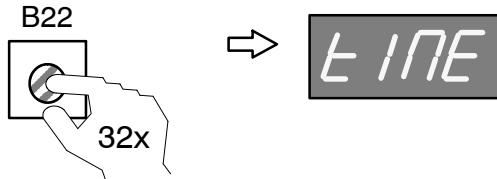
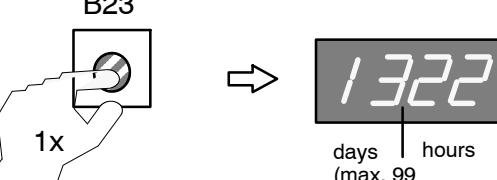
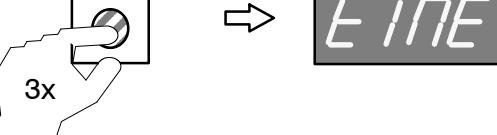
Seq. No.	Indications	Comments, Notes
cont. 29	<p><u>nSGL</u> = NMEA-telegram (Strings of the GLL-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>DIP-Switch B20 configuration and resulting strings:</p> <ul style="list-style-type: none"> B22 (27x): nSGL B23 (7x): 30 .0 B23 (8x): 00, E B23 (9x): , 123 B23 (10x): 029 . B23 (11x): 34, 8 B23 (12x): 504E (Checksum)

Seq. No.	Indications	Comments, Notes
cont. 29	<p><u>nSGL</u> = NMEA-telegram (Strings of the GLL-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>With the 1st operation of the contact switch B23, the number of ASCII-characters is displayed. If the display shows "0000", no telegram-output took place. With every further operation of contact switch, 4 consecutive ASCII-characters are displayed.</p>
30	<p><u>nSLL</u> = NMEA-telegram (Strings of the SLL-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>The number of operations depends on the number of characters (1 display content = max. 4 ASCII-characters)</p> <p>See seq. no. 29</p> <p>Number of ASCII-characters per telegram 0000 = no telegram</p>

Distribution Unit

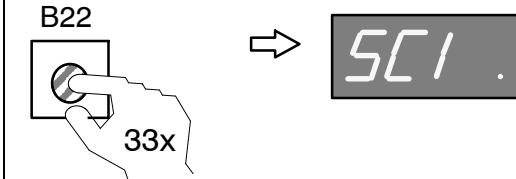
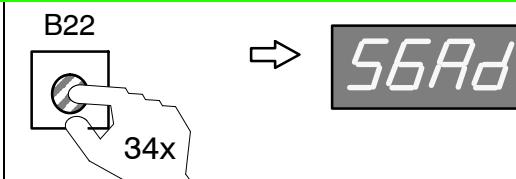
138-118

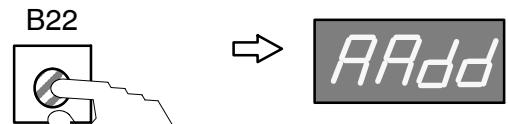
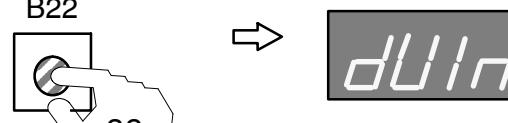
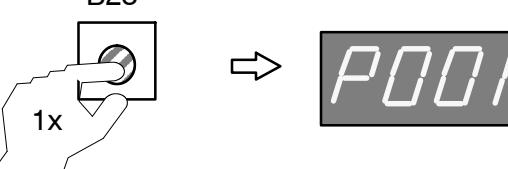
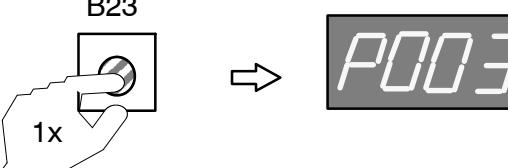
Seq. No.	Indications	Comments, Notes
31	<p><u>nShw</u> = NMEA-telegram (Strings of the VHW-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p>  <p>B23</p>  <p>Number of ASCII-characters per telegram 0000 = no telegram</p> <p>The number of operations depends on the number of characters. (1 display content = max. 4 ASCII-characters)</p> <p>See seq. no. 29</p>
32	<p><u>nStG</u> = NMEA-telegram (Strings of the VTG-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	<p>B22</p>  <p>B23</p>  <p>Number of ASCII-characters per telegram 0000 = no telegram</p> <p>The number of operations depends on the number of characters. (1 display content = max. 4 ASCII-characters)</p> <p>See seq. no. 29</p>

Seq. No.	Indications	Comments, Notes
33	<p><u>nSbw</u> = NMEA-telegram (String of the VBW-telegram)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>Number of ASCII-characters per telegram 0000 = no telegram</p> <p>The number of operations depends on the number of characters. (1 display content = max. 4 ASCII-characters)</p> <p>See seq. no. 29</p>
34	<p><u>TIME</u> = Time since activating speed error correction (Reset with power-off)</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>days hours (max. 99)</p>  <p>minutes seconds</p> 

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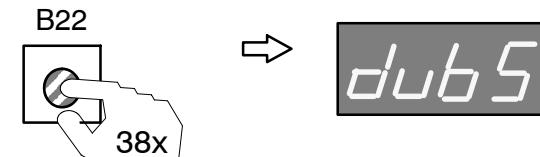
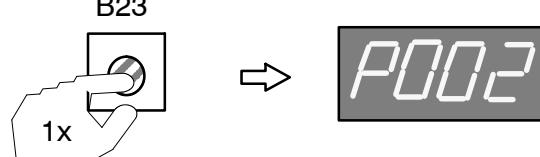
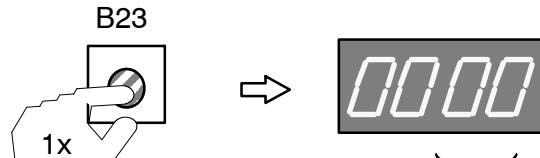
138-118

Seq. No.	Indications	Comments, Notes
35	<p style="text-align: center;">Development only!</p> <p><u>SCI</u> . = Serial Communication Interface NMEA Log/ GPS input</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>The content of the two digits is during a data transfer unrecognisable. Just the digits $1_{(16)}$ and $0_{(16)}$ are visible for a short moment; ($10_{(16)}$ means line feed). All other sequentially indicated values are for development purpose only.</p>
36	<p><u>SGAd</u> = CAN-bus address of selected gyro sensor</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 <p>The content of the two digits is during a data transfer unrecognisable. Just the digits $1_{(16)}$ and $0_{(16)}$ are visible for a short moment; ($10_{(16)}$ means line feed). All other sequentially indicated values are for development purpose only.</p>

Seq. No.	Indications	Comments, Notes
37	<u>AAdd</u> = Alarm address of a defective Gyro compass DIP-Switch B20: positions 6,7 and 8	  0000 → no faulty Gyro otherwise the CAN address.
38	dUin = Software version of the CAN-bus processor of the Interface PCB DIP-Switch B20: positions 6,7 and 8	 
39	doUt = Software version of the I/O-PCB of the Distribution Unit DIP-Switch B20: positions 6,7 and 8	 

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Seq. No.	Indications	Comments, Notes
40	<p>dubS = Software version of the DV-bus processor of the Interface PCB</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	 
41	<p>UTC = Time of *ZDA-Telegram</p> <p>DIP-Switch B20: positions 6,7 and 8</p>	  <p>2x → Minutes Seconds</p> <p>3x → Day Month</p> <p>4x → Year</p>
<p>With this signal the time for a connected course printer is synchronised. This UTC-signal normally is received via a GPS receiver. The signal may be connected at terminal board L2, terminal 15(RX+) and terminal 16 (RX-)</p>		

8.1 Table of DIP-switch functions

8.1.1 Adjustments

DIP-switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
1+2	1	20 (address)	CAN-bus address setting of Distribution Unit. Perform processor reset with B21 after changing address	upwards	downwards
4	1	MAGn	Magnetic compass activation		
	2	MAGn	Bring display to flash to activate input	choose	set
1	1	nME1	NMEA channel 1 configuration		
	2	nME1.0	Select for NMEA, 1/sec	choose	set
	3	nME0.1	Select for NMEA, 10/sec	choose	set
	4	EHdT	Select for HEHDT telegram	choose	set
	5	CHdT	Select for HCHDT telegram	choose	set
	6	IHdG	Select for HCHDG telegram	choose	set
	7	IroT	Select for TIROT telegram	choose	set
	8	EroT	Select for HEROT telegram	choose	set
2	1	nME2	NMEA channel 2 configuration		
	2	nME1.0	Select for NMEA, 1/sec	choose	set
	3	nME0.1	Select for NMEA, 10/sec	choose	set
	4	EHdT	Select for HEHDT telegram	choose	set
	5	CHdT	Select for HCHDT telegram	choose	set
	6	IHdG	Select for HCHDG telegram	choose	set
	7	IroT	Select for TIROT telegram	choose	set
	8	EroT	Select for HEROT telegram	choose	set
1+2+3	1	Chn1	Output channels 1-8 data selection	choose	
	2	HSEr	Select for heading serial (LED red)	choose	set
	3	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	4	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	5	Chn2		choose	
	6	HSEr	Select for heading serial (LED red)	choose	set
	7	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	8	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	9	Chn3		choose	
	10	HSEr	Select for heading serial (LED red)	choose	set
	11	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	12	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	13.....	Chn4....8		choose	
			Same procedure than for channels above		

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DIP-switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
3	1	-ro-	RoT output scaling	choose	
	2	r30	Select for 30°/minute	choose	set
	3	r100	Select for 100°/minute	choose	set
	4	r300	Select for 300°/minute	choose	set
	5	Gy	Select for analog heading output	choose	set

8.1.2

Adjustments E10

DIP-switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
1+2	1	20 (ad-dress)	CAN-bus address setting of Distribution Unit. Perform processor reset with B21 after changing address	upwards	down-wards
4	1	MAGn	Magnetic compass activation		
	2	MAGn	Bring display to flash to activate input	choose	set
1		nME1	NMEA channel 1 configuration		
	1	CY.1	Adjusting Baudrate: 1/sec, 4800Bd	choose	set
	2	CY.10	Adjusting Baudrate: 10/sec, 4800Bd	choose	set
	3	cY.10	Adjusting Baudrate: 10/sec, 9600Bd	choose	set
	4	CY.50	Adjusting Baudrate: 50/sec, 38.4kBd	choose	set
	5	EHdT	Select for HEHDT telegram	choose	set
	6	CHdT	Select for HCHDT telegram	choose	set
	7	IHdG	Select for HCHDG telegram	choose	set
	8	IroT	Select for TIROT telegram	choose	set
	9	EroT	Select for HEROT telegram	choose	set
2		nME2	NMEA channel 2 configuration		
	1	CY.1	Adjusting Baudrate: 1/sec, 4800Bd	choose	set
	2	CY.10	Adjusting Baudrate: 10/sec, 4800Bd	choose	set
	3	cY.10	Adjusting Baudrate: 10/sec, 9600Bd	choose	set
	4	CY.50	Adjusting Baudrate: 50/sec, 38.4kBd	choose	set
	5	EHdT	Select for HEHDT telegram	choose	set
	6	CHdT	Select for HCHDT telegram	choose	set
	7	IHdG	Select for HCHDG telegram	choose	set
	8	IroT	Select for TIROT telegram	choose	set
	9	EroT	Select for HEROT telegram	choose	set

DIP-switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
1+2+3	1	Chn1	Output channels 1-8 data selection	choose	
	2	HSEr	Select for heading serial (LED red)	choose	set
	3	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	4	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	5	Chn2		choose	
	6	HSEr	Select for heading serial (LED red)	choose	set
	7	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	8	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	9	Chn3		choose	
	10	HSEr	Select for heading serial (LED red)	choose	set
	11	nME1	Select for NMEA, 1/sec (LED green)	choose	set
	12	nME2	Select for NMEA, 10/sec (LED blue)	choose	set
	13.....	CHn4....12		choose	
			Same procedure than for channels above		
3	1	-ro-	RoT output scaling	choose	
	2	r30	Select for 30°/minute	choose	set
	3	r100	Select for 100°/minute	choose	set
	4	r300	Select for 300°/minute	choose	set
	5	Gy	Select for analog heading output	choose	set

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8.1.3

Displays

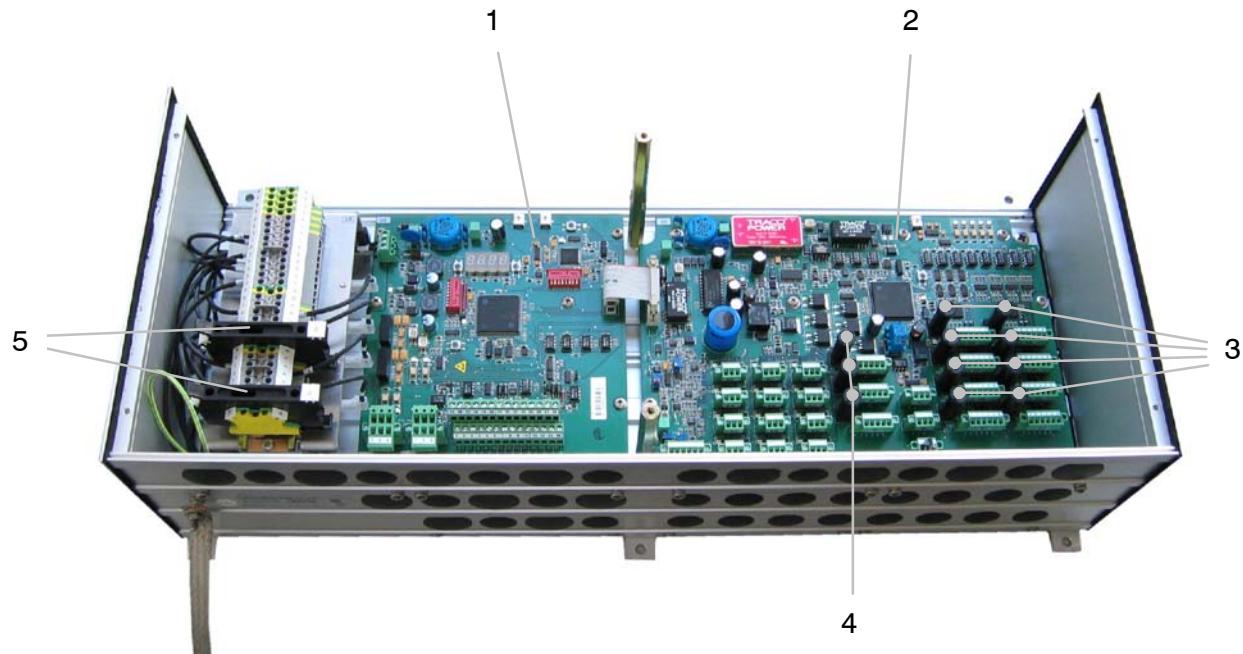
DIP-Switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
8	1	Sen1	Heading value of Sensor 1	choose	display
	2	Sen2	Heading value of Sensor 2	choose	display
	3	Sen3	Heading value of Sensor 3	choose	display
	4	Sen4	Heading value of Sensor 4	choose	display
	5	PLoG	Speed value from puls log	choose	display
	6	P-11	11V supply voltage of I/O PCB	choose	display
	7	P-35	35V supply voltage for I/O PCB for step	choose	display
6+7+8		UnCo	Uncorrected course without SEC	display	choose
	1	Corr	Corrected course with SEC	display	choose
	2	Gyr1	Uncorrected heading of gyro 1	display	choose
	3	Addr	CAN-bus address of gyro 1	display	choose
	4	Gyr2	Uncorrected heading of gyro 2	display	choose
	5	Addr	CAN-bus address of gyro 2	display	choose
	6	Gyr3	Uncorrected heading of gyro 3	display	choose
	7	Addr	CAN-bus address of gyro 3	display	choose
	8	NAGS	Uncorrected heading of magnetic compass	display	choose
	9	NAGC	Corrected heading of magnetic compass	display	choose
	10	NISS	Variation value	display	choose
	11	dEul	Deviation value	display	choose
	12	Nrot	Rate of turn of magnetic compass	display	choose
	13	u_N	Manual speed input from operator unit	display	choose
	14	Sci	Telegram traffic on serial interface	display	choose
	15	SrC.S	Speed source information	display	choose
	16	PULS	Speed value from puls log	display	choose
	17	vtG.S	Speed value from GPS	display	choose
	18	vtG.h	Course value from GPS	display	choose
	19	uhu.	Speed value from NMEA telegram (vhw)	display	choose
	20	SPD.A	Selected speed value in knots	display	v
	21	PoS	Latitude in degrees	display	choose
	22	ASPD	Alarm speed information	display	choose
	23	PoSn	Latitude from automatic latitude input	display	choose
	24	APoS	Alarm position input information	display	choose
	25	nAn1	1st table of NMEA requests	display	choose
	26	nAn2	2nd table of NMEA requests	display	choose
	27	nSGG	String of GGA telegram	display	choose
	28	nSGL	String of GLL telegram	display	choose
	29	nSLL	String of SLL telegram	display	choose
	30	nShu	String of VHW telegram	display	choose
	31	nStG	String of VTG telegram	display	choose
	32	nSbu	String of VBW telegram	display	choose

DIP-Switch	Step	Display	Function	Push button B23 (left)	Push button B22 (right)
	33	tINE	Time since activating SEC	display	choose
	34	SCI	Display serial communication interface	display	choose
	35	SGAd	CAN-bus address of selected sensor	display	choose
	36	AAdd	Alarm address of defective Gyro	display	choose
	37	dUIn	Software version interface pcb processor	display	choose
	38	doUt	Software version I/O pcb processor	display	choose
	39	dubs	Software version DV-bus processor	display	choose
	40	UtC	Time telegram content	display	choose

Distribution Unit

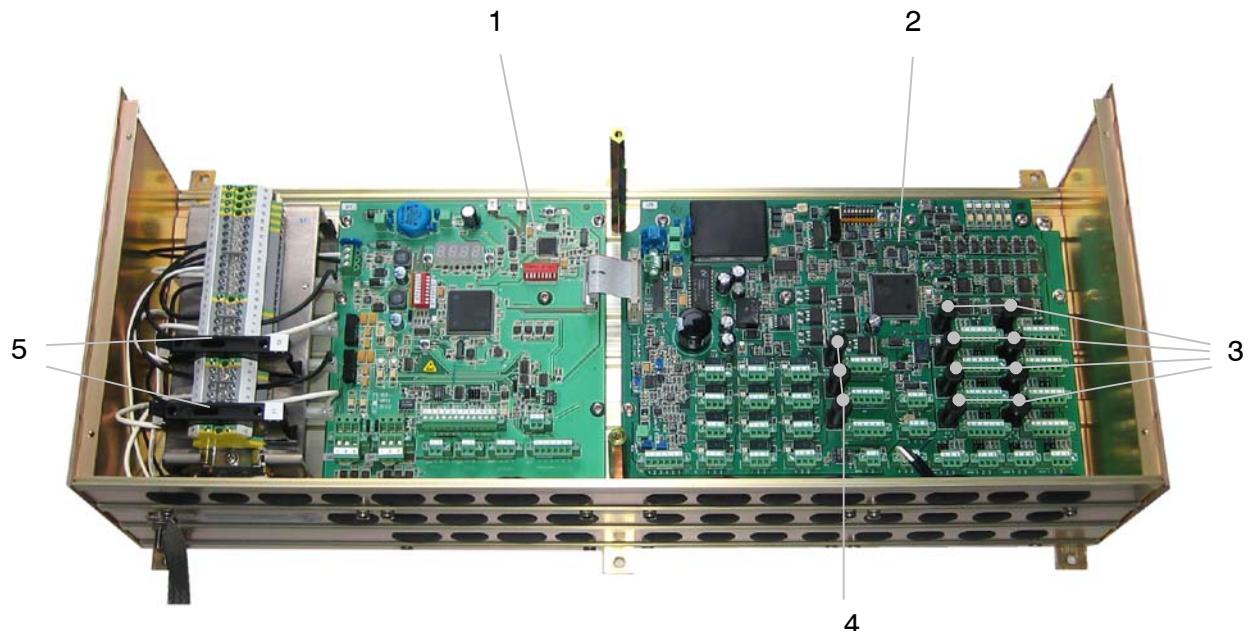
138-118

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Pos.	Lager-Nr. Stock-No.	Benennung	Designation	Zeichnungs.Nr. Part-No.	Stck. Qty.	Herst.-Code MFRC	Versorgungs-Nr. NSN
1	3609431	Interface PCB, AT	Interface PCB, recond	138-118.103 AT	1	D2865	
2	3609430	I/O PCB, AT	I/O PCB, recond	138-118.101 AT	1	D2865	
3	1.762017	G-Sicherungseinsatz	Fuse	T 1 A L 250 V IEC 127-2	8	D3841	5920-12-167-4252
4	1760517	G-Sicherungseinsatz	Fuse	T 0,25 A L 250 V IEC 127-2	3	D3841	
5	1762137	G-Sicherungseinsatz	Fuse	T 10A 250 V 7006565	2	D2598	5920-00-780-8905

All depicted items which are not mentioned in the text are not applicable for this unit. Since further development may necessitate making modifications to existing equipment, its conformity with the relevant illustrations and drawings is not always ensured. Raytheon Marine will be under no liability whatever that may arise from any such differences.



Pos.	Lager-Nr. Stock-No.	Benennung	Designation	Zeichnungs-Nr. Part-No.	Stck. Qty.	Herst.-Code MFRC	Versorgungs-Nr. NSN
1	3609701	Interface PCB, AT	Interface PCB, recond.	138-118.100 AT E10.X01	1	D2865	
2	3609702	I/O PCB, AT	I/O PCB, recond.	138-118.101 AT E10.X01	1	D2865	
3	1.762017	G-Sicherungseinsatz	Fuse	T 1 A L 250 V IEC 127-2	8	D3841	5920-12-167-4252
4	1760517	G-Sicherungseinsatz	Fuse	T 0,25 A L 250 V IEC 127-2	3	D3841	
5	1762137	G-Sicherungseinsatz	Fuse	T 10 A 250 V 7006565	2	D2598	5920-00-780-8905

All depicted items which are not mentioned in the text are not applicable for this unit. Since further development may necessitate making modifications to existing equipment, its conformity with the relevant illustrations and drawings is not always ensured. Raytheon Anschütz will be under no liability whatever that may arise from any such differences.

